Treating Adolescent Substance Use

A Clinician's Guide

Justine W. Welsh
Scott E. Hadland
Editors

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Editors
Justine W. Welsh, MD
Department of Psychiatry and
Behavioral Sciences
Emory University School of Medicine
Atlanta, GA, USA

Scott E. Hadland, MD, MPH, MS
Division of General Pediatrics
Department of Pediatrics
Boston University School of Medicine
Boston, MA, USA

Grayken Center for Addiction/
Department of Pediatrics
Boston Medical Center
Boston, MA, USA

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Preface

Welcome to *The Clinician's Guide to Treating Adolescent Substance Use*. Clinicians are now facing new substance use-related challenges such as the opioid crisis, a changing political landscape regarding marijuana, and the emergence of new delivery devices such as e-cigarettes. This changing landscape of addiction impacts many adolescents and young adults. Unfortunately, we need significantly more clinicians who can offer developmentally informed treatment approaches for adolescents with substance use disorders. The inspiration for this book was not to add another textbook to the literature but to provide a useful clinical guide about the best practices for treating adolescent substance use disorders from medical, behavioral, and social standpoints.

This book is unique in that it is co-edited by a child/adolescent psychiatrist (Dr. Welsh) and a primary care pediatrician (Dr. Hadland), each with a subspecialty training in addiction. This combined background ensures that medicine and behavioral health will be integrated throughout the text. Dr. Welsh is the director of a multidisciplinary outpatient adolescent and young adult treatment service for individuals with problematic substance use at Emory University School of Medicine. In this role, she also provides training and education in adolescent substance use disorder treatment to child/adolescent psychiatry fellows, addiction psychiatry fellows, psychiatry residents, and psychology trainees. Dr. Hadland is a clinician-investigator who focuses his clinical work and research on addiction treatment for youth, and he also serves as an associate program director for the Boston Combined Residency Program in pediatrics, a role in which he incorporates teaching on addiction into general pediatric training.

As editors, we have selected experts from the field including Dr. John Rogers Knight, creator of CRAFFT, the most utilized screening tool for adolescent substance use; Dr. Mark D. Godley, co-developer of A-CRA, a widely used treatment manual for this population; Dr. Sharon Levy, senior author of several substance use-related policy statements for the American Academy of Pediatrics; and Dr. Nancy Rappaport, who has nearly two decades of experience as a school consultant through Harvard Medical School. Throughout the text, we aim to discuss the prevalence of substance use among adolescents and young adults, prevention strategies,

available screening methods, as well as practical treatment applications and their outcomes. Furthermore, we offer practical explanations of the differences between inpatient and outpatient treatment and strategies for coordinating care between the health-care system and the broader community. Finally, we have included an appendix of cases to demonstrate how to implement these practices in real-world settings.

We would like to take the time to acknowledge our developmental editor, Michael Wilt, for his dedication to this piece, as well as our families for their support and patience. We hope you enjoy this guide. Thank you for being part of our audience and for providing care to this underserved population of youth!

Atlanta, GA, USA Justine W. Welsh, MD
Boston, MA, USA Scott E. Hadland, MD, MPH, MS

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Contributors

Sarah M. Bagley, MD, MSc Section of General Internal Medicine, Department of Medicine, Boston University School of Medicine/Boston Medical Center, Boston, MA, USA

Division of General Pediatrics, Department of Pediatrics, Boston University School of Medicine/Boston Medical Center, Boston, MA, USA

Ann Bruner, MD Maryland Treatment Centers, Baltimore, MD, USA

Brittany L. Carney, MS Graduate School of Nursing, University of Massachusetts Medical School, University of Massachusetts Worcester, Worcester, MA, USA

Nicholas Chadi, MD Division of Developmental Medicine, Adolescent Substance Use and Addiction Program, Boston Children's Hospital, Harvard Medical School, Boston, MA, USA

Anita Chu, MD Child Guidance Center of Southern Connecticut, Stamford, CT, USA

Laura Duda, MD Department of Pediatrics, Penn State Children's Hospital at the Milton S. Hershey Medical Center, Hershey, PA, USA

Marc Fishman, MD Maryland Treatment Centers, Baltimore, MD, USA

Department of Psychiatry, Johns Hopkins University School of Medicine, Baltimore, MD, USA

Mark D. Godley, PhD Lighthouse Institute, Chestnut Health Systems, Normal, IL, USA

Jessica Gray, MD Departments of Medicine and Pediatrics, Massachusetts General Hospital/Harvard Medical School, Boston, MA, USA

Leslie S. Green, LICSW Adolescent Substance Use and Addiction Program, Division of Developmental Medicine, Boston Children's Hospital, Boston, MA, USA

Department of Social Work, Boston Children's Hospital, Boston, MA, USA

Scott E. Hadland, MD, MPH, MS Grayken Center for Addiction/Department of Pediatrics, Boston Medical Center, Boston University School of Medicine, Boston, MA, USA

Division of General Pediatrics, Department of Pediatrics, Boston University School of Medicine, Boston, MA, USA

Christopher J. Hammond, MD, PhD Division of Child and Adolescent Psychiatry, Johns Hopkins University School of Medicine, Baltimore, MD, USA

Behavioral Pharmacology Research Unit, Johns Hopkins University School of Medicine, Baltimore, MD, USA

Department of Psychiatry and Behavioral Sciences, Johns Hopkins University School of Medicine, Baltimore, MD, USA

Banku Jairath, MD Department of General Pediatrics, Penn State Hershey Children's Hospital at the Milton S. Hershey Medical Center, Hershey, PA, USA

Jungjin Kim, MD Division of Alcohol and Drug Abuse, McLean Hospital/Harvard Medical School, Belmont, MA, USA

John R. Knight, MD Department of Pediatrics, Harvard Medical School, Boston, MA, USA

Department of Medicine and Psychiatry, Boston Children's Hospital, Boston, MA, USA

Sharon Levy, MD, MPH Adolescent Substance Use and Addiction Program, Division of Developmental Medicine, Boston Children's Hospital, Boston, MA, USA

Department of Pediatrics, Harvard Medical School, Boston, MA, USA

Lora L. Passetti, MS Lighthouse Institute, Chestnut Health Systems, Normal, IL, USA

Nancy Rappaport, MD Department of Psychiatry, Cambridge Health Alliance, Harvard Medical School, Cambridge, MA, USA

Collin M. Reiff, MD Department of Psychiatry, New York University School of Medicine, New York, NY, USA

Dana Sarvey, MD Department of Child and Adolescent Psychiatry, McLean Hospital, Belmont, MA, USA

Harvard Medical School, Boston, MA, USA

Miriam A. Schizer, MD, MPH Adolescent Substance Use and Addiction Program, Division of Developmental Medicine, Boston Children's Hospital, Boston, MA, USA

Department of Pediatrics, Harvard Medical School, Boston, MA, USA

Jesse W. Schram, MSW, LICSW Department of Social Work, Adolescent Substance Use and Addiction Program, Boston Children's Hospital, Boston, MA, USA

Patricia C. F. Schram, MD Department of Medicine, Boston Children's Hospital, Boston, MA, USA

Department of Pediatrics, Harvard Medical School, Boston, MA, USA

Pravesh Sharma, MD Division of Child and Adolescent Psychiatry, Johns Hopkins University School of Medicine, Baltimore, MD, USA

David G. Stewart, PhD, ABPP Department of Psychiatry, Cambridge Health Alliance, Harvard Medical School, Cambridge, MA, USA

Valeria Tretyak, BSc, MSc, MRes Department of Psychology, The University of Texas at Austin, Austin, TX, USA

Department of Psychiatry, Dell Medical School at The University of Texas at Austin, Austin, TX, USA

Leslie R. Walker-Harding, MD Department of Pediatrics, Penn State Children's Hospital, Hershey, PA, USA

Justine W. Welsh, MD Department of Psychiatry and Behavioral Sciences, Emory University School of Medicine, Atlanta, GA, USA

Jennifer Woolard, MSW LCSW Emory Adolescent Substance Use Treatment Services, Division of Child, Adolescent and Young Adult Programs, Emory Healthcare, Atlanta, GA, USA

Part I
Introduction

Chapter 1
Epidemiology and Historical Drug Use Patterns

Scott E. Hadland

Introduction

There is cause for both optimism and concern regarding recent trends in adolescent substance use. Use of most substances among adolescents has declined substantially over the last two decades (Fig. 1.1). Use of traditional cigarettes, a well-established risk factor for cardiovascular disease, stroke, pulmonary disease, and cancer, has declined to historically low levels [1]. Alcohol use, a primary contributor to the top three causes of death among adolescents—motor vehicle crash deaths, suicide, and homicide—and a precursor to lifelong health and psychosocial consequences, has also continued an unprecedented decline [2–4]. Even the more recent concern of opioid misuse reached a peak in 2009, but has dropped steadily since then [5].

However, despite these clear improvements in the epidemiology of adolescent substance use, significant concerns remain, and new challenges have arisen. The threat of traditional cigarettes has been replaced to some extent by the rising popularity of electronic cigarettes ("e-cigarettes") and vaping, which have been shown to contain many of the same carcinogens—albeit at lower concentrations—than traditional cigarettes [6]. Data demonstrates that e-cigarettes may also be a gateway to subsequent traditional cigarette use [7]. Despite declines in alcohol use, substantial disparities exist by race and socioeconomic status, with improvements in heavy drinking patterns among black and economically disadvantaged adolescents less pronounced than among other adolescents [2, 3, 5]. Although the prevalence of "any" and "past-year" use of opioids has declined among the general population of adolescents, there is clearly a subset of youth using opioids at increasing risk as

S. E. Hadland (✉)
Grayken Center for Addiction/Department of Pediatrics, Boston Medical Center, Boston University School of Medicine, Boston, MA, USA

Division of General Pediatrics, Department of Pediatrics, Boston University School of Medicine, Boston, MA, USA
e-mail: scott.hadland@bmc.org

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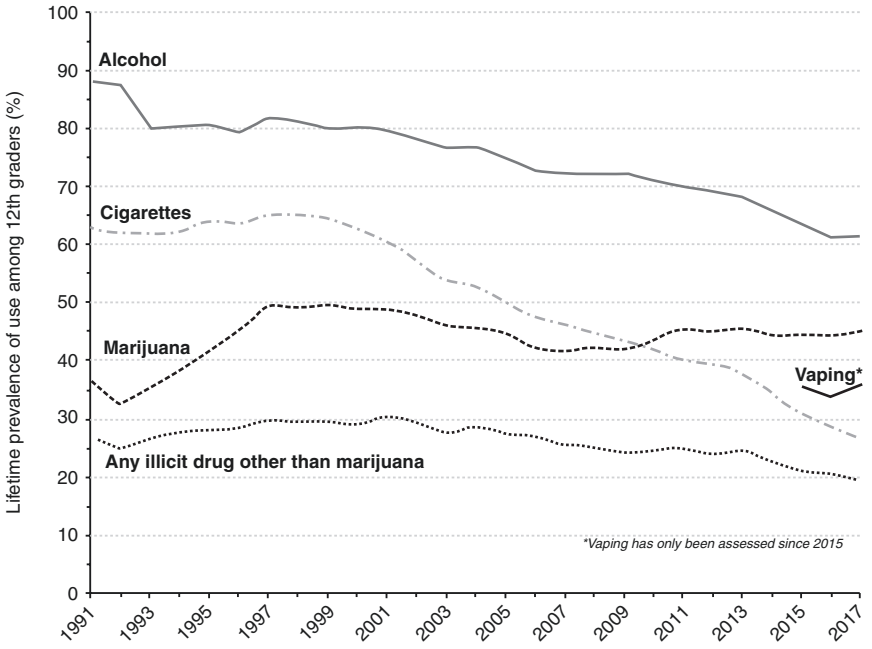

Fig. 1.1 Trends in use of common substances in the general adolescent population in the United States. (Data source: Johnston et al. [5] p. 54–5)

evidenced by rising overdose mortality, hospitalizations for overdoses, and diagnoses of opioid use disorder [8–10]. Finally, whereas the prevalence of use for almost every substance surveyed among adolescents has declined, marijuana use—including heavy use—has risen in recent years amidst a changing policy landscape that has favored legalization of recreational marijuana [5].

Since nine out of every ten adults with a substance use disorder first used substances before the age of 18, clinicians caring for adolescents are at the front line of early detection of and intervention in substance use [11]. The purpose of this chapter is to give a brief overview of the major substances of concern for adolescents and historical and recent epidemiologic trends in their use. This review of critical epidemiology will set the stage for subsequent chapters in which readers will better understand developmental concerns related to adolescent substance use, screening, treatment, prevention, and recovery. After a brief review of the national surveys used in the United States to track substance use in the general adolescent population, this chapter will review recent and historical trends in use of alcohol, marijuana, nicotine, opioids, and other substances.

Table 1.1 National surveys of substance use among the general adolescent population in the United States

	Monitoring the Future	Youth Risk Behavior Surveillance System	National Survey on Drug Use and Health
Organization	University of Michigan Institute for Social Research, National Institute on Drug Abuse	Centers for Disease Control and Prevention	RTI International, Substance Abuse and Mental Health Services Administration
Sampling	School-based	School-based	Household-based
Population	8th, 10th, and 12th graders	9th, 10th, 11th, and 12th graders	12 years and older (also includes adults)
Number sampled	50,000	Approximately 15,000 (varies)	70,000
Years available	1975 to present	1991 to present	1971 to present
Frequency of survey	Yearly	Every other year on odd-numbered years	Yearly
Sample omissions	Excludes youth not present on day of survey	Excludes youth not present on day of survey	May exclude homeless youth

Adolescent Substance Use Surveys

In the United States, three national surveys of the general adolescent population track trends in substance use over time (Table 1.1). These three surveys include Monitoring the Future (MTF), the Youth Risk Behavior Surveillance System (YRBSS), and the National Survey on Drug Use and Health (NSDUH) [5, 12, 13]. The first two of these, MTF and YRBSS, are school-based surveys of 8th, 10th, and 12th graders and 9th through 12th graders, respectively; the third, the NSDUH, is a household-based survey of 12–17-year-olds. Because of these sampling approaches, adolescents absent from school on the day of the survey or who are homeless are not included in the studies' findings; notably, these adolescents may have elevated rates of alcohol or other substance use [14].

In addition to providing nationally representative data on alcohol and drug use among adolescents, these three surveys contain other questions that are helpful in understanding the broader context of adolescent substance use. MTF goes into substantial depth to highlight how frequent and recent an adolescent's drug use is and also probes perceived harmfulness of use, disapproval of use, and availability of substances [5]. Due to the richness of substance-specific data and its yearly administration, this chapter relies largely on MTF estimates of adolescent substance use prevalence.

YRBSS has fewer questions devoted solely to substance use, but asks adolescents about sexual behaviors, human immunodeficiency virus (HIV) and sexually transmitted disease prevention, pregnancy prevention, behaviors associated with violence and unintentional injury, diet and physical activity, and depression and suicide-related behaviors [13]. The NSDUH explores co-occurring mental ill-

ness, as well as receipt of substance use treatment mental health services. Thus, each survey allows clinicians, researchers, and policies to examine critical indicators related to substance use in order to shape clinical practice, public health, and policy.

Internationally, similar surveys—sometimes including exactly the same questions—exist in other countries to tabulate substance use in the general adolescent population. For example, the Canadian Tobacco, Alcohol and Drugs Survey (CTADS), as well as a series of provincial surveys analogous to YRBSS, tracks adolescent substance use in Canada [15]. A similar survey exists in the United Kingdom [16]. Readers should become familiar with what data are available in their own country in order to understand current trends in adolescent substance use. Additionally, in the United States and elsewhere, data on substance use and its associated morbidity and mortality is not limited to information from national surveys; a number of insurance- and hospital-based claims databases also provide critical information on trends in substance use-related admissions, discharges, and treatment services across the country (e.g., see Ref. [11]).

Epidemiology and Historical Patterns of Substance Use

Alcohol

Alcohol is, and historically has been, the most commonly used substance among adolescents [5, 12, 13]. Nonetheless, use has steadily declined over several decades, such that in 2017, the percentage of 8th, 10th, and 12th graders reporting past-30-day use of alcohol was 8%, 20%, and 33%, respectively [5]. Binge drinking, defined as five or more drinks on a single occasion, is associated with serious physical and mental health outcomes [17] and has also steadily declined after reaching a peak in the late 1970s [5]. Traditionally, whereas adolescent males have demonstrated a much higher prevalence of binge drinking than females, males have also experienced a faster recent decline in binge drinking, such that sex differences have become substantially less pronounced in recent years [2, 3, 5].

Declines in binge drinking may not have been uniform by race or socioeconomic status either. Since 2007, the decline in "frequent heavy drinking" (defined as at least two occasions of binge drinking in the past 2 weeks) has declined more rapidly among white adolescents than black adolescents, even after accounting for other potentially confounding factors [2, 3, 5]. Adolescents with lower socioeconomic status (i.e., higher poverty) have similarly experienced slower declines in heavy frequent drinking than youth with higher socioeconomic status (i.e., lower poverty).

Reducing the prevalence of binge drinking—and of alcohol use more generally—among adolescents is critical due to immediate and downstream consequences of use. The top three causes of death among adolescents in the United States are unintentional injury (the majority of which are caused by motor vehicle crashes [MVC]), homicide, and suicide [18]. Alcohol use clearly contributes to all three,

with alcohol implicated in nearly half of all male MVC deaths and one-third of all female MVC deaths, half of all homicide deaths among both sexes, and one-quarter of all suicide deaths among both sexes [19, 20].

In the long term, adolescent alcohol consumption is a strong predictor of progression to heavy drinking and/or development of an alcohol use disorder during adulthood [21], which is in turn associated with adverse health outcomes including alcoholic liver disease and cirrhosis, multiple forms of cancer, stroke, hypertension, pancreatitis, cardiomyopathy, and numerous other health conditions [19]. There are also clear links between heavy alcohol use and short- and long-term adverse mental health and psychosocial outcomes, including mood and anxiety disorders, poor school and work performance, and problems with family members [21].

Marijuana

Whereas use of most substances, including alcohol, has steadily declined since the 1990s, marijuana use has remained relatively constant or increased among US adolescents [5]. Across high school students surveyed in MTF, past-year use has leveled or increased leading up to 2017, such that currently, 24%, or nearly one in four high school students (grades 8, 10, and 12 combined), report past-year use of marijuana. Daily use of marijuana is highest among 12th graders, with 5.9% or approximately 1 in 17 reporting daily use.

The persistently high prevalence of marijuana use among adolescents may be related to the rapidly changing policy landscape in the United States. As of mid-2018, eight states had legalized marijuana for recreational purposes for adults, many of them passed by ballot measures brought directly to voters in 2012, 2014, and 2016 [22]. Marijuana is legalized for medicinal purposes (if certified by a physician) in 30 states and the District of Columbia. Finally, possession of small amounts of marijuana (typically less than 1–2 ounces) has been decriminalized in 22 states and the District of Columbia, meaning that possession of small amounts of marijuana (typically less than 1–2 ounces) is typically a civil infraction, rather than a state crime for most adults.

Whether laws legalizing marijuana for recreational or medicinal purposes have contributed to increasing marijuana use (or prevented a decline that might have otherwise occurred) among adolescents has been subject to numerous studies. In Washington State, self-reported past-month marijuana use increased among 8th and 10th graders after marijuana was legalized for recreational purposes; in Colorado, there was no observed difference after implementation of its law [23]. A systematic review of studies examining the impact of medical marijuana laws did not show any change in the prevalence of adolescent marijuana use across states that had implemented such policies [24].

What is clear, however, is that adolescent perceptions of marijuana as a harmful substance are declining [5, 23], regardless of the underlying cause. As the percentage of adolescents viewing harm in regular use of marijuana has declined, the percentage reporting recent daily use of marijuana has increased in lockstep (Fig. 1.2). Clinicians should be aware of these relaxing perceptions of harm and ensure that

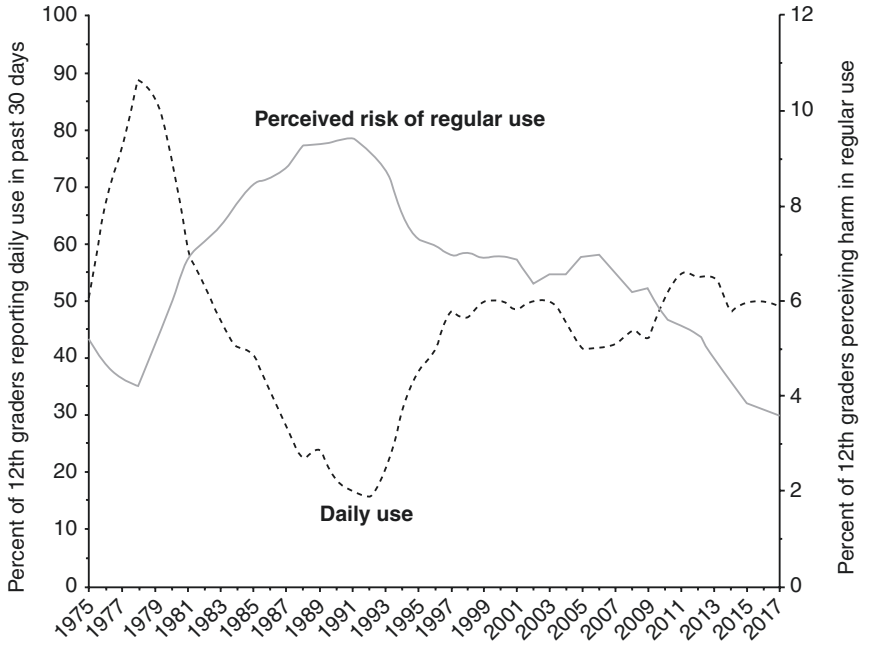

Fig. 1.2 Daily use of marijuana in the past 30 days in relation to perceived harm of regular marijuana use among 12th graders in the United States. (Data sources: Johnston et al. [5] p. 96–8 and Miech et al. [35])

adolescents and their families are aware of potential harms of regular marijuana use. Additionally, adolescents and their families should be aware that the potency of marijuana has steadily increased in recent decades [25]. Whereas rigorous public health campaigns have been mounted to educate the public regarding the harms of alcohol, tobacco, and other substances, the harms of regular marijuana use among adolescents may be less well known.

Potential harms of regular (i.e., daily or near-daily) use of marijuana during adolescence include both physical and mental health concerns, both in the short and long terms [26]. Unlike cigarettes, no associations between smoking marijuana and cancer, cardiovascular disease, or stroke have been identified. However, regular marijuana users are more likely to experience wheezing, cough, and mucus production; develop *cannabis hyperemesis syndrome*, an intractable vomiting condition; and, among male users, develop a dose-dependent decrease in testosterone and accompanying change in sexual function. Perhaps more concerning are strong associations between regular marijuana use during adolescence and adverse psychiatric and neuropsychiatric outcomes. Regular adolescent users demonstrate a decrease in intelligence quotient (IQ) that persists into adulthood and are at elevated risk for developing psychosis [27, 28]. Finally, despite the perception of many youth that driving following marijuana use is not as risky as driving after drinking alcohol, odds of fatal motor vehicle crash are nearly double following marijuana use [29].

Nicotine

In 2016, approximately one in five (20.2%) US high school students reported current use of nicotine products; nearly half reported use of multiple products [1]. These national data from the National Youth Tobacco Surveys (NYTS) marked a reassuring decline from 2015, at which time current use of any nicotine product had continued to rise, largely driven by a steady increase in the prevalence of e-cigarette use. As noted earlier in this chapter, combustible cigarette use has steadily declined since the late 1990s, but this public health success has been threatened by the popularity of e-cigarettes among youth. Use of other tobacco and nicotine products, such as hookah, chewing tobacco, and snus, remains popular as well.

A recent meta-analysis demonstrated that youth who use e-cigarettes—also known as "vaping"—are more likely to transition to combustible cigarettes [7]. Additionally, e-cigarette users include youth who might not otherwise smoke combustible cigarettes [30]. Several aspects of e-cigarettes may make them highly appealing to adolescents. They may have flavored cartridges, which attract some youth, and newer, compact designs such as that of the "JUUL" device (which has the appearance of a portable computer "jump drive") which allow youth to more readily hide their use [31]. Although marketing of e-cigarettes and other vaping products to youth has been restricted by the US Food and Drug Administration since 2016, numerous ad campaigns—which not explicitly targeting adolescents—may be highly effective at recruiting adolescents along with adult audiences.

Adolescents may also view e-cigarettes as safer than combustible cigarettes [7]. Numerous e-cigarette manufacturers advertise that their devices are "safe" and effective when used as a smoking cessation device that can be used to wean off combustible cigarettes. Since the numerous compounds in cigarettes across multiple manufacturers have yet to be fully characterized—and yet clearly include many of the same carcinogens as combustible cigarettes, as well as other toxins unique to e-cigarettes—it is critical that providers educate patients and families of the as-yet poorly understood potential harms of e-cigarette use [31].

Finally, it is important for providers to assess *what* adolescents vape. Cartridges in most devices can be filled with numerous different fluids, including flavoring without nicotine, flavoring with nicotine, or even tetrahydrocannabinol (THC), the psychoactive compound present in marijuana. In 2017, the MTF survey asked adolescents for the first time what was in their vaping fluid [5]. Among 12th graders, 30.7% reported having ever vaped just flavoring, 25.0% reported having vaped nicotine, and 11.9% reported having vaped marijuana. Further studies are needed to fully elucidate what particular risks may be associated with these various practices.

Opioids

Although the percentage of 12th graders who have ever used heroin in their lifetime is very low (0.3%), overall, approximately 1 in 15 adolescents (6.8%) has ever used a prescription opioid not prescribed to them. This percentage has slowly declined since its peak of 13.2% in 2009. Of all adults in treatment for opioid use disorder, one in three reports that their first use was before age 18, highlighting the pediatric onset of this condition and the importance of early intervention [11]. Therefore, it is recommended that clinicians routinely screen adolescents for the use of opioids, including nonmedical use of prescription opioids, which are relatively more available in some settings and may be perceived as "safe," since they are prescribed [32]. Screening for prescription opioid use is covered in greater depth in Chap. 3.

Though relatively less commonly used by adolescents than other substances, opioids (especially when used nonmedically) carry a high risk of overdose, particularly given the emerging threat of fentanyl, a highly potent opioid [33]. Fentanyl is normally an opioid prescribed for pain and is highly potent (up to 50–100 times more potent than heroin); only a very small amount can cause lethal overdose. Beginning in 2015, illicitly manufactured fentanyl, the precursors for which are readily synthesized overseas and imported into the United States, became implicated in a rising number of overdose deaths. In some jurisdictions, as many as three-quarters of all overdose deaths now involve fentanyl. Illicitly manufactured fentanyl now taints the heroin supply and is used as a basis for producing counterfeit prescription pills; in many settings, it also contaminates unrelated drug supplies, such as the cocaine supply. The risk of overdose from fentanyl, heroin, and prescription opioids is potentiated by co-ingestion of benzodiazepines, which greatly increase the risk of respiratory depression. Adolescent opioid-related overdoses have more than doubled since 1999 and experienced a year-over-year increase of 19% from 2014 to 2015 [9].

Given the high risk of overdose and serious complications related to opioid use and their injection (including transmission of human immunodeficiency virus and hepatitis C virus, as well as numerous other infectious complications), it is critical that adolescents who use opioids receive early intervention. The American Academy of Pediatrics and American Society of Addiction Medicine recommend that adolescents, like adults, receive medication treatment with buprenorphine, naltrexone, or methadone, in addition to behavioral health services [34]. Despite the efficacy of these medications, adolescents are only one-tenth as likely as adults to receive medication treatment, likely owing to stigma surrounding medication use and the short supply of providers who prescribe medications to adolescents [8]. Use of medications for opioid use disorder is discussed in greater depth in Chap. 7.

Other Substances

A full review of all substances used by adolescents is beyond the scope of this chapter. However, some general trends can be noted for other substances. Past-year use of inhalants is highest among 8th graders and reported by 4.7%, or approximately 1 in 20 [5]; older adolescents, including both 10th and 12th graders, are less likely to use inhalants. The relatively high prevalence among younger adolescents is likely owing to their availability around typical households. Therefore, it is important that, after asking about alcohol, marijuana, and tobacco, clinicians also specifically ask about "anything else" that adolescents may use to get high [32].

Unlike inhalant use, the prevalence of use of most other substances tends to rise as adolescents age. The prevalence of stimulant use, including use of prescription stimulants typically used to treat attention deficit hyperactivity disorder, rises steadily through the adolescent years; more than 1 in 20 of 12th graders reported past-year use of the stimulant Adderall [5]. Stimulants may be used recreationally by adolescents to have more energy in social situations or sometimes used nonmedically to enhance performance in academics and sports. Again, the relatively common nonmedical use of stimulants highlights the importance of screening for their use by clinicians [32].

In recent years, past-year use of other substances has steadily fallen, including use of cocaine, crack, crystal methamphetamine, synthetic marijuana (also known as "K2" or "Spice"), hallucinogens, PCP, ecstasy, salvia, and over-the-counter cough medications [5].

Conclusion

This summary of adolescent substance use epidemiology and historical trends lays the groundwork for the chapters to follow. An understanding of the common patterns of substance use among adolescents—not only nationally but also in a clinician's local jurisdiction—is critical to inform screening and management of adolescent substance use. Data suggest that of all individuals in the United States with a substance use disorder, nine out of ten first began using substances before the age of 18 [11]. Thus, clinicians working with adolescents have a central role to play in preventing the harms, both immediate and lifelong, of substance use.

Take-Home Points

- Epidemiological trends in adolescent substance use are rapidly changing, with use of most substances, including alcohol, combustible cigarettes, and most other illicit substances and prescription pills, declining.
- Three national surveys in the United States track the prevalence of adolescent substance use: Monitoring the Future (MTF), the Youth Risk Behavior Surveillance System (YRBSS), and the National Survey on Drug Use and Health (NSDUH); similar surveys are in place in other countries internationally.
- Substance use contributes substantially to the top three causes of death among US adolescents: unintentional injury (the majority of which are motor vehicle crashes), homicide, and suicide.
- Alcohol use and binge drinking are declining but not uniformly; in particular, rates among males have declined more rapidly than females, such that gender differences are now less pronounced.
- Despite an overall decline in use of most substances, marijuana use—and in particular daily marijuana use—has risen recently in the setting of rapid policy changes in the United States; similarly, e-cigarettes and vaping have recently become popular among adolescents.

References

1. Jamal A, Gentzke A, Hu SS, Cullen KA, Apelberg BJ, Homa DM, et al. Tobacco use among middle and high school students – United States, 2011–2016. MMWR Morb Mortal Wkly Rep. 2017;66(23):597–603.
2. Jang JB, Patrick ME, Keyes KM, Hamilton AD, Schulenberg JE. Frequent binge drinking among US adolescents, 1991 to 2015. Pediatrics. 2017;139(6):e20164023.
3. Welsh JW, Knight JR, Hadland SE. Adolescent frequent heavy drinking from 1991–2015. Pediatrics. 2017;139(6):e20170932.
4. Gonzales K, Roeber J, Kanny D, Tran A, Saiki C, Johnson H, et al. Alcohol-attributable deaths and years of potential life lost – 11 States, 2006–2010. MMWR Morb Mortal Wkly Rep. 2014 Mar;63(10):213–6.
5. Johnston LD, Miech RA, O'Malley PM, Bachman JG, Schulenberg JE, Patrick ME. Monitoring the future national survey results on drug use: 1975–2017: overview, key findings on adolescent drug use. Ann Arbor: Institute for Social Research, The University of Michigan; 2018.
6. Goniewicz ML, Knysak J, Gawron M, Kosmider L, Sobczak A, Kurek J, et al. Levels of selected carcinogens and toxicants in vapour from electronic cigarettes. Tob Control. 2014;23(2):133–9.
7. Soneji S, Barrington-Trimis JL, Wills TA, Leventhal AM, Unger JB, Gibson LA, et al. Association between initial use of e-cigarettes and subsequent cigarette smoking among adolescents and young adults: a systematic review and meta-analysis. JAMA Pediatr. 2017;171(8):788–97.
8. Hadland SE, Wharam JF, Schuster MA, Zhang F, Samet JH, Larochelle MR. Trends in receipt of buprenorphine and naltrexone for opioid use disorder among adolescents and young adults, 2001–2014. JAMA Pediatr. 2017;171(8):747–55.

9. Curtin SC, Tejada-Vera B, Warner M. Drug overdose deaths among adolescents aged 15–19 in the United States: 1999–2015. NCHS Data Brief, no 282. Atlanta; 2017.
10. Gaither JR, Leventhal JM, Ryan SA, Camenga DR. National trends in hospitalizations for opioid poisonings among children and adolescents, 1997 to 2012. JAMA Pediatr. 2016;170(12):1195–201.
11. Substance Abuse and Mental Health Services Administration Center for Behavioral Health Statistics and Quality. Treatment Episode Data Set (TEDS): 2003–2013. Rockville: National Admissions to Substance Abuse Treatment Services; 2015.
12. Substance Abuse and Mental Health Services Administration. Key substance use and mental health indicators in the United States: results from the 2016 National Survey on Drug Use and Health (HHS Publication No. SMA 17-5044, NSDUH Series H-52). Rockville: Center for Behavioral Health Statistics and Quality, Substance Abuse and Mental Health Services Administration; 2017.
13. Kann L, McManus T, Harris WA, Shanklin SL, Flint KH, Hawkins J, et al. Youth risk behavior surveillance – United States. MMWR Surveill Summ. 2015;65(6):1–174.
14. Corliss HL, Goodenow CS, Nichols L, Austin SB. High burden of homelessness among sexual-minority adolescents: findings from a representative Massachusetts high school sample. Am J Public Health. 2011;101(9):1683–9.
15. Statistics Canada. Canadian Tobacco, Alcohol and Drugs Survey (CTADS): 2015 summary [Internet]. Ottawa: Health Canada; 2017. https://www.canada.ca/en/health-canada/services/canadian-tobacco-alcohol-drugs-survey/2015-summary.html. Accessed 10 Apr 2018.
16. National Health Service. Smoking, drinking and drug use among young people in England – 2016 [Internet]. Leeds: NHS Digital; https://digital.nhs.uk/catalogue/PUB30132. Accessed 10 Apr 2018.
17. US Department of Health and Human Services and US Department of Agriculture. 2015–2020 dietary guidelines for Americans. 8th ed. Washington, DC: US Department of Health and Human Services and US Department of Agriculture; 2015.
18. Heron M. Deaths: leading causes for 2015. Natl Vital Stat Rep. 2017;66(5):1–76.
19. Centers for Disease Control and Prevention. Alcohol-attributable deaths and years of potential life lost among American Indians and Alaska Natives – United States, 2001–2005. MMWR Morb Mortal Wkly Rep. 2008;57(34):938–41.
20. Hadland SE, Xuan Z, Sarda V, Blanchette J, Swahn MH, Heeren TC, et al. Alcohol policies and alcohol-related motor vehicle crash fatalities among young people in the US. Pediatrics. 2017;139(3):e20163037.
21. Buchmann AF, Schmid B, Blomeyer D, Becker K, Treutlein J, Zimmermann US, et al. Impact of age at first drink on vulnerability to alcohol-related problems: testing the marker hypothesis in a prospective study of young adults. J Psychiatr Res. 2009;43(15):1205–12.
22. National Conference of State Legislatures. Marijuana Overview [Internet]. Washington, DC: National Conference of State Legislatures; 2017. http://www.ncsl.org/research/civil-and-criminal-justice/marijuana-overview.aspx. Accessed 7 May 2018.
23. Cerdá M, Wall M, Feng T, Keyes KM, Sarvet A, Schulenberg J, et al. Association of state recreational marijuana laws with adolescent marijuana use. JAMA Pediatr. 2017;171(2):142–9.
24. Sarvet AL, Wall MM, Fink DS, Greene E, Le A, Boustead AE, et al. Medical marijuana laws and adolescent marijuana use in the United States: a systematic review and meta-analysis. Addiction. 2018;113(6):1003–16.
25. Mehmedic Z, Chandra S, Slade D, Denham H, Foster S, Patel AS, et al. Potency trends of Delta9-THC and other cannabinoids in confiscated cannabis preparations from 1993 to 2008. J Forensic Sci. 2010;55(5):1209–17.
26. Hadland SE, Harris SK. Youth marijuana use: state of the science for the practicing clinician. Curr Opin Pediatr. 2014;26(4):420.

27. Meier MH, Caspi A, Ambler A, Harrington H, Houts R, Keefe RS, et al. Persistent cannabis users show neuropsychological decline from childhood to midlife. Proc Natl Acad Sci U S A. 2012;109(40):E2657–64.
28. Moore TH, Zammit S, Lingford-Hughes A, Barnes TR, Jones PB, Burke M, et al. Cannabis use and risk of psychotic or affective mental health outcomes: a systematic review. Lancet. 2007;370(9584):319–28.
29. Asbridge M, Hayden JA, Cartwright JL. Acute cannabis consumption and motor vehicle collision risk: systematic review of observational studies and meta-analysis. BMJ. 2012;344: e536.
30. Demissie Z, Everett Jones S, Clayton HB, King BA. Adolescent risk behaviors and use of electronic vapor products and cigarettes. Pediatrics. 2017;139(2):e20162921.
31. Pankow JF, Kim K, McWhirter KJ, Luo W, Escobedo JO, Strongin RM, et al. Benzene formation in electronic cigarettes. PLoS One. 2017;12(3):e0173055.
32. Committee on Substance Use and Prevention. Substance use screening, brief intervention, and referral to treatment. Pediatrics. 2016;138(1):e20161211.
33. Gladden RM, Martinez P, Seth P. Fentanyl law enforcement submissions and increases in synthetic opioid–involved overdose deaths — 27 states, 2013–2014. MMWR Morb Mortal Wkly Rep. 2016;65(33):837–43.
34. Committee on Substance Use and Prevention. Medication-assisted treatment of adolescents with opioid use disorders. Pediatrics. 2016;138(3):e20161893.
35. Miech RA, Johnston LD, O'Malley PM, Bachman JG, Schulenberg JE, Patrick ME. Monitoring the future national survey results on drug use, 1975–2016: Volume I, Secondary school students. Ann Arbor: Institute for Social Research, The University of Michigan; 2017. p. 229–31.

Chapter 2
Developmental Perspectives and Risk Factors for Substance Use

Sharon Levy, Miriam A. Schizer, and Leslie S. Green

Adolescent Development

Brain Development

Physiological brain maturation renders adolescence a critical at-risk period for substance use, since adolescence is a key period for both initiating substance use and laying down neurological pathways that, if altered, may predispose young people to future substance use disorders.

The limbic system, and in particular the nucleus accumbens, which is often referred to as the brain's "reward center," matures rapidly during preadolescence and the early adolescent years [1]. This maturation is developmentally associated with improved discrimination between less and more meaningful rewards, a capacity that is necessary for the development of motivation and goal-driven behavior during adolescence. While children are young, they are easily rewarded by small tokens, but as they age, they become increasingly selective. This phenomenon peaks during adolescence, during which the presentation of small or meaningless rewards (such as stickers) results in decreased firing in the nucleus accumbens [2]. Thus, adolescents are developmentally "wired" to seek large rewards, a trait that is recognizable in the risk-taking behavior associated with this stage of life.

S. Levy (✉) · M. A. Schizer
Adolescent Substance Use and Addiction Program, Division of Developmental Medicine, Boston Children's Hospital, Boston, MA, USA

Department of Pediatrics, Harvard Medical School, Boston, MA, USA
e-mail: sharon.levy@childrens.harvard.edu

L. S. Green
Adolescent Substance Use and Addiction Program, Division of Developmental Medicine, Boston Children's Hospital, Boston, MA, USA

Department of Social Work, Boston Children's Hospital, Boston, MA, USA

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Psychoactive substance use can satisfy the normal adolescent drive for large rewards, since all substances trigger signaling in the nucleus accumbens directly or indirectly through receptor binding and in so doing "hijack" the natural reward system. Thus, while unhealthy, substance use fills a developmental drive for stimulation in this area of the brain very effectively. Accordingly, the peak ages of substance use initiation are during adolescence and early adulthood [3].

While the limbic system is rapidly developing during adolescence, the prefrontal cortex is developing much more slowly. The prefrontal cortex is the region of the brain typically responsible for overriding and interacting with the reward system, in a sense serving as a behavioral "brake." However, the prefrontal cortex does not fully develop until individuals reach their mid-twenties. As a result, adolescents are relatively undeterred by risk and consequence, further promoting risk-taking behavior (Fig. 2.1).

Due to these and other neurological changes throughout adolescence, the risk of developing a substance use disorder is highly correlated with an earlier age of substance use initiation. For example, children who report being drunk before age 14 are approximately three times more likely to develop an alcohol use disorder compared to those who initiate at age 19 [5]. A similar pattern is seen both with marijuana—with a fourfold increase in risk for early initiators compared to those who first use in late adolescence or adulthood [6]—and various other substances, including prescription opioids when used nonmedically [7]. Indeed, delaying substance use initiation into adulthood may substantially reduce the risk of ever developing a substance use disorder, as evidenced by data showing that of all 18- to 30-year-olds

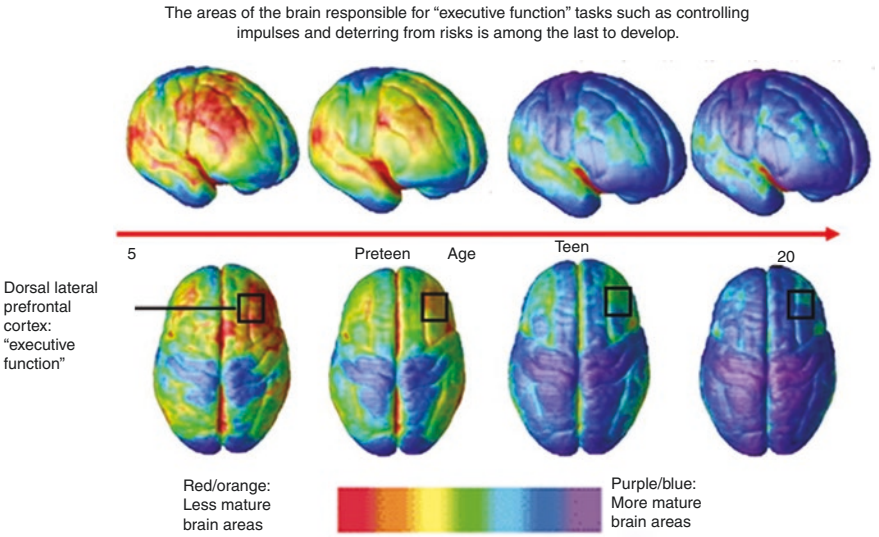

Fig. 2.1 Dynamic sequences of cortical GM maturation in healthy children ages 4–22 demonstrating the normal lagged development of the dorsal lateral prefrontal cortex. (Used with permission of Elsevier and adapted from Gogtay and Thompson [4])

admitted to substance use treatment, 74% initiated use of alcohol or drugs at age 17 or younger, and 40% did so before the age of 15 [8, 9].

Social Development

Adolescence is also a period of significant social development. During this time, the primary social group shifts from family to peers, and awareness of both self and of the surrounding world grows [10]. Adolescents begin to question how they fit in within their peer group and larger society. The crucial developmental task at hand is to explore personal core values, beliefs, and goals and to ultimately align these with their behavior.

Parents, while no longer viewed by adolescents as part of their primary social group, continue to hold a significant role in their child's development. Adolescents need ongoing parental involvement to feel safe and contained; however, they strive to individuate and separate from their parents, often pulling against parental control. While tension between parents and adolescents is normal, it can escalate to problematic levels when earlier parenting techniques become ineffective and parents are unsure how to change to address the idiosyncrasies of adolescent behavior [10].

The developmental challenges of adolescence can leave youth vulnerable to substance use. Adolescents may initiate substance use because their peers are trying it or because they are influenced by the modeling of substance use by music, sports, and entertainment icons whose identities they are trying to emulate. Substance use can be used to numb feelings of depression, anxiety, or other emotional states that are felt strongly during adolescence. It can also be used as a coping mechanism to manage the stress of school and/or the tension in relationships with parents or peers.

Historically and in more traditional societies, individuals have been supported through the transitional period of adolescence by rites of passage. As these rites have become de-emphasized in modern American society, adolescents are left more on their own to decide how best to bridge childhood and adulthood. The natural tendency is to choose actions and presentations they perceive as "adult." These choices can, and often do, include use of alcohol and other substances, a ritual that youth may perceive as marking their first steps toward becoming adults.

Developmental Vulnerabilities to the Impact of Substances

The physiological and social vulnerabilities to substance use reviewed above are aggravated by environmental factors including the availability, promotion, and modeling of substance use behaviors. Teens are particularly sensitive to the influence of peers and advertising [11, 12]. Taken together and understood within the context of brain and social development, these factors explain a large part of why alcohol and marijuana use are so common during adolescence.

Additionally, substance use *patterns* are also affected by age and developmental status. For example, one of the primary effects of alcohol is to increase gamma-aminobutyric acid (GABA) release, which results in both sedation and, indirectly, increased dopamine release. For most adults, the sedation effect naturally curbs intake. Adolescents, however, are relatively insensitive to the sedative properties of alcohol, leaving them more vulnerable than adults to continue intake beyond safe levels [13, 14]. Dopamine release, including in the nucleus accumbens, leads to the neurological reward that adolescents are driven to seek and thereby may promote heavy consumption for this age group [15]. The National Institute of Alcohol Abuse and Alcoholism (NIAAA) estimates that 90% of all alcohol consumed by underage drinkers is part of a binge [16]. Alcohol intoxication also increases levels of glutamate which slows down neurological transmission and the processing of sensory information, increasing the risk of unintentional injury—including motor vehicle crashes—for both adolescents and adults [17]. While it may be tempting to compare, youth and adult drinking are quite dissimilar, and developmental biology would predict that "teaching" adolescents to drink "responsibly" or in adult patterns is not likely to be effective. Parents supplying adolescents with alcohol, presumably in efforts to encourage safe drinking in a supervised environment, is associated with increased likelihood of alcohol-related harms [18].

Like alcohol, exposure to marijuana has differing effects on adolescents compared to adults. Cannabinoids, the active molecules in marijuana (including tetrahydrocannabinol, the principal psychoactive compound), are depressants that prevent cells from releasing chemical messengers into the synapse [19]. The presence of exogenous cannabinoids can interfere with normal brain development [20]. By suppressing cell signaling, exogenous cannabinoids interfere with the process of neuronal pruning and can potentially interfere with the process of myelination; both pruning and myelination are critical for brain development [21]. Morphological studies have found that several areas of the brain are smaller in individuals with a history of marijuana use during adolescence compared to peers [22]. These changes may be the basis for the cognitive [23] and functional [24] declines observed among individuals who used marijuana regularly during adolescence, which may persist into adulthood even long after an individual has ceased using marijuana. The consequences of marijuana use on the developing brain are thought to occur in a dose-dependent fashion, and no safe dose has been identified [21].

Adolescent marijuana users are also more likely to develop an opioid use disorder [25]. The association is not completely understood, though the interrelation between the cannabinoid and opioid systems may underlie a true biological basis for this "gateway." Many neurons in the central nervous system express both opioid and cannabinoid receptors, and binding to one of the cannabinoid receptors appears to modulate opioid function at a number of different levels, resulting in cross talk between systems and mutual potentiation [26]. It is also possible that marijuana use "primes" the adolescent brain, resulting in neurological changes that make it even more susceptible to developing addiction upon exposure to opioids. Nonetheless, it is also possible that the association between marijuana use

and subsequent opioid use is related to an individual's predisposition to using substances or greater access to opioids through the same social contacts who supply marijuana to an adolescent.

The legal and social acceptance of marijuana use ushered in by rapid policy changes, including the availability of cannabis for medicinal or recreational purposes, has strengthened the implicit message that substance use is benign, changing the way adolescents think about marijuana. According to a large national study of high school students done in 2016, only 29% of high school seniors think that regular use of marijuana is harmful, a 50% decline in this statistic over the past 20 years [27]. Misconceptions that marijuana is "healthy because it's natural" or "safe because it's legal" have cultural traction but are false, and a strong public health response to recent policy changes demands consistent messaging to the contrary.

Nicotine also has unique impacts on the developing brain, making use during adolescence particularly risky. Rates of traditional cigarette use by high school students have fallen dramatically in the last 20 years [27], though use of newer forms of nicotine including electronic cigarettes or "e-cigarettes" is on the rise [27], largely due to promotion of these products as fun. While e-cigarettes do spare users the products of combustion that are responsible for much of the harms of traditional cigarettes, they are not safe as they are known to contain carcinogens and other harmful chemicals. Furthermore, initiation of nicotine use in any form during adolescence is associated with initiation of traditional tobacco products [28].

An understanding of developmental risk factors is critical in designing prevention and intervention efforts. For instance, public health-driven attempts to substitute supposedly "less harmful" substances—such as e-cigarettes as a safer alternative to tobacco—may be logical for adult smokers but are off-target for this age group. The most developmentally appropriate message is similar to that of alcohol use during pregnancy: there is no known safe level of consumption of psychoactive substances during adolescence, and nonuse is best for health.

Risk and Protective Factors

All adolescents are at risk for experiencing consequences from alcohol and other drug use, though a number of risk factors place some at higher risk than others. These include mental and emotional health disorders, experience of trauma, genetics, family dynamics, and environmental factors such as peers, school, and community. These factors can influence the initiation of use and can increase the risk of experiencing substance use-related problems or of developing substance use disorders. Similarly, numerous protective factors have also been described that mitigate the effects of these known risk factors in individual adolescents.

Mental health disorders are more common in adolescents than younger children. Rates of depression double as children enter puberty [10], and depression is strongly associated with substance use [29]. Anxiety, behavior disorders, and

attention deficit hyperactivity disorder (ADHD) are all associated with substance use [30], which simultaneously serves as a coping mechanism and leads to increased symptomatology.

Genetic loading, which is often associated with a broader family history of substance use disorders, is one of the most important substance use risk factors for children of affected parents. Twin studies have shown that the heritability of substance use disorders ranges from 40% to 60% [31]. Parental substance use, which may be associated with poor monitoring and family dysfunction, is a risk factor above and beyond the genetic risk. Parents with substance use disorders may model use as normative and have more permissive attitudes toward use by their own children. In contrast, parenting practices that include moderate to high monitoring—defined as knowing where and with whom children are spending their time—combined with emotional and instrumental support and strong family structure are protective against adolescent substance use [32].

Early school failure, low school commitment, and poor school engagement represent risk factors for substance use [33]. These factors partially underlie the association between ADHD and other disorders that make academic work difficult and increase the risk of substance use. Peer substance use is the single most important risk factor related to substance use initiation. Children and adolescents with high-risk personality patterns are also more likely to associate with deviant peers. Environmental strategies that engage young people in positive activities have successfully reduced alcohol and tobacco use and are an important component of any substance use prevention strategy [34].

Addressing Substance Use as Part of Routine Health Care

Substance use is the most common and arguably the most important modifiable health behavior of childhood and adolescence. In recognition of the strong impact on health, the past two decades have seen an increased emphasis on screening and managing substance use as part of routine health care in pediatrics as in other areas of medicine. When caring for younger children, health-care providers have the opportunity to give clear guidance about the appropriate use, storage, and disposal of both prescription and over-the-counter medications and can also recommend talking to young children about the proper use of medications.

To counter unhealthy cultural messages that encourage intoxication, parents can discuss healthful, substance-free means to express or resolve feelings such as elation, disappointment, or pain. High yet attainable expectations and role-modeling healthy choices have positive impacts on children. Parents should be encouraged to speak frequently with their children in an open and developmentally appropriate manner about substance use. “Teachable moments” help broach the topic of substance use in a non-threatening manner. Even young children can be made aware of nearby smoking in a way that discourages tobacco use. Parents of school-age chil-

dren can use advertisements, news media articles, and local stories to start a discussion. Conversations of this sort should encourage children to join the discussion, ask questions, and formulate a healthy lifestyle. Even parents who smoke can promote anti-smoking messages with their children and, as found by Jackson and Dickinson, can decrease the likelihood that their children will ever smoke [35]. The American Academy of Pediatrics recommends that health-care providers routinely deliver the message to both adolescents and parents that nonuse is the best health advice for adolescents [36].

Alcohol and marijuana use by older adolescents is often perceived as a developmental milestone rather than a modifiable behavior, and consequently advice to limit or use "safely" is common. However, an approach that advises adolescents to use "carefully" or "in moderation" may inadvertently encourage substance use, as these messages can easily be misinterpreted as explicitly allowing youth to use substances. Advice that may seem reasonable and practical to physicians and other adults may have the unintended consequence of encouraging the behavior it is attempting to extinguish. Concerns that nonuse is unrealistic may stem from a social bias within a culture that promotes binge alcohol use as part of the "college experience" and marijuana use as "natural." National surveys demonstrate that the expectation that substance use during adolescence is inevitable is incorrect. For example, the past 20 years have shown sharp and sustained declines in rates of both alcohol and combustible cigarette use. In this same period, the rate of overall substance nonuse has grown from 2% to more than 25% [38]. This growing trend suggests that substance use is not the inevitable rite of passage it was once considered, but rather a modifiable health risk behavior.

Summary

The profound neurodevelopmental and social changes that occur in adolescence contribute to significant developmental vulnerability for substance use initiation and progressive use. An understanding of these and other well-defined risk factors serves as an important foundation for prevention and treatment efforts (Table 2.1).

Take-Home Points

1. Adolescence represents a developmental window during which brain areas associated with reward-seeking are increasingly active and areas associated with moderation and risk aversion are underdeveloped, making teens particularly at risk for substance use initiation and harms from use.
2. Many substances have a different, and more dangerous, effect on the adolescent brain than they have on the adult brain.

Table 2.1 Risk and protective factors of substance use in adolescents

Persons	Risk factors	Protective factors
Individual	Behavioral disengagement coping Negative emotionality Conduct disorder Favorable attitudes toward drugs Rebelliousness Early substance use Antisocial behavior	Positive physical development Emotional self-regulation High self-esteem Good coping skills and problem-solving skills Engagement and connections in two or more of the following contexts: at school, with peers, in athletics, employment, religion, culture
Family	Substance use among parents Lack of adult supervision Poor attachment with parents	Family provides structure, limits, rules, monitoring, and predictability Supportive relationships with family members Clear expectations for behavior and values
School, peers, community	School failure Low commitment to school Associating with drug-using peers Not college bound Aggression toward peers Norms (e.g., advertising) favorable toward alcohol use Accessibility/availability	Presence of mentors and support for development of skills and interests Opportunities for engagement within school and community Positive norms Clear expectations for behavior Physical and psychological safety

Source: From Youth.gov [37]

3. Parents supplying adolescents with alcohol, presumably in efforts to encourage safe drinking in a supervised environment, is associated with increased likelihood of alcohol-related harms.
4. Social, cultural, and environmental factors may compound adolescents' vulnerability to harm from substances but also have the potential to be protective factors.
5. Clear and consistent messages advising abstinence from substances from healthcare providers may be effective in reducing adolescent substance use.

References

1. Arain M, Haque M, Johal L, Mathur P, Nel W, Rais A, et al. Maturation of the adolescent brain. Neuropsychiatr Dis Treat. 2013;9:449–61.
2. Galvan A. Adolescent development of the reward system. Front Hum Neurosci. 2010;4:6.
3. Lipari R, Kroutil LA, Pemberton MR. Risk and protective factors and initiation of substance use: results from the 2014 national survey on drug use and health. NSDUH Data Review; 2015. https://www.samhsa.gov/data/sites/default/files/NSDUH-DR-FRR4-2014rev/NSDUH-DR-FRR4-2014.pdf. Accessed 25 July 2018.

4. Gogtay N, Thompson PM. Mapping gray matter development: implications for typical development and vulnerability to psychopathology. Brain Cogn. 2010;72(1):6–15.
5. Hingson RW, Heeren T, Winter MR. Age at drinking onset and alcohol dependence: age at onset, duration, and severity. Arch Pediatr Adolesc Med. 2006;160(7):739–46.
6. Le Strat Y, Dubertret C, Le Foll B. Impact of age at onset of cannabis use on cannabis dependence and driving under the influence in the United States. Accid Anal Prev. 2015;76:1–5.
7. McCabe SE, West BT, Morales M, Cranford JA, Boyd CJ. Does early onset of non-medical use of prescription drugs predict subsequent prescription drug abuse and dependence? Results from a national study. Addiction. 2007;102(12):1920–30.
8. Jordan CJ, Andersen SL. Sensitive periods of substance abuse: early risk for the transition to dependence. Dev Cogn Neurosci. 2017;25:29–44.
9. Substance Abuse and Mental Health Services Administration. Center for Behavioral Health Statistics and Quality. Treatment Episode Data Set (TEDS): 2003–2013. State Admissions to Substance Abuse Treatment Services. BHSIS Series S-80, HHS Publication No. (SMA) 16-4964. Substance Abuse and Mental Health Services Administration: Rockville; 2015.
10. Berger KS. The developing person through childhood and adolescence. 6th ed. New York: Worth Publishing; 2003.
11. Ennett ST, Bauman KE, Hussong A, Faris R, Foshee VA, Cai L, et al. The peer context of adolescent substance use: findings from social network analysis. J Res Adolesc. 2006;16(2):159–86.
12. Committee on Communications, American Academy of Pediatrics C on C, Strasburger VC, Sherwood N, Story M, Walsh D, Hogan M. Children, adolescents, and advertising. Pediatrics. 2006;118(6):2563–9.
13. White AM, Scott Swartzwelder H. Age-related effects of alcohol on memory and memory-related brain function in adolescents and adults. In: Galanter M, Lowman C, Boyd GM, Faden VB, Witt E, Lagressa D, editors. Recent developments in alcoholism. Boston: Springer; 2005.
14. Little PJ, Kuhn CM, Wilson WA, Swartzwelder HS. Differential effects of ethanol in adolescent and adult rats. Alcohol Clin Exp Res. 1996;20(8):1346–51.
15. He J, Hodge C. Adolescent cortical development: a critical period of vulnerability for addiction. Pharmacol Biochem Behav. 2007;86(2):189–99.
16. National Institute on Alcohol Abuse and Alcoholism. Underage drinking. https://pubs.niaaa.nih.gov/publications/underagedrinking/Underage_Fact.pdf. Accessed 25 July 2018.
17. Valenzuela CF. Alcohol and neurotransmitter interactions. Alcohol Health Res World. 1997;21(2):144–8.
18. Mattick RP, Clare PJ, Aiken A, Wadolowski M, Hutchinson D, Najman J, et al. Association of parental supply of alcohol with adolescent drinking, alcohol-related harms, and alcohol use disorder symptoms: a prospective cohort study. Lancet Public Health. 2018;3(2):e64–71.
19. Grotenhermen F. Pharmacokinetics and pharmacodynamics of cannabinoids. Clin Pharmacokinet. 2003;42(4):327–60.
20. Lubman DI, Cheetham A, Yücel M. Cannabis and adolescent brain development. Pharmacol Ther. 2015;148:1–16.
21. Jacobus J, Tapert SF. Effects of cannabis on the adolescent brain. Curr Pharm Des. 2014;20(13):2186–93.
22. Price JS, McQueeny T, Shollenbarger S, Browning EL, Wieser J, Lisdahl KM. Effects of marijuana use on prefrontal and parietal volumes and cognition in emerging adults. Psychopharmacology. 2015;232(16):2939–50.
23. Schweinsburg AD, Brown SA, Tapert SF. The influence of marijuana use on neurocognitive functioning in adolescents. Curr Drug Abuse Rev. 2008;1(1):99–111.
24. Meier MH, Caspi A, Ambler A, Harrington H, Houts R, Keefe RSE, et al. Persistent cannabis users show neuropsychological decline from childhood to midlife. Proc Natl Acad Sci U S A. 2012;109(40):E2657–64.
25. Fiellin LE, Tetrault JM, Becker WC, Fiellin DA, Hoff RA. Previous use of alcohol, cigarettes, and marijuana and subsequent abuse of prescription opioids in young adults. J Adolesc Health. 2013;52(2):158–63.

26. Scavone JL, Sterling RC, Van Bockstaele EJ. Cannabinoid and opioid interactions: implications for opiate dependence and withdrawal. Neuroscience. 2013;248:637–54.
27. Johnston LD, O'Malley PM, Miech RA, Bachman JG, Schulenberg JE. Monitoring the future national survey results on drug use, 1975–2015: overview, key findings on adolescent drug use. Ann Arbor; 2016. http://www.monitoringthefuture.org/pubs/monographs/mtf-overview2015.pdf. Accessed 25 July 2018.
28. Hammond D, Reid JL, Cole AG, Leatherdale ST. Electronic cigarette use and smoking initiation among youth: a longitudinal cohort study. CMAJ. 2017;189(43):E1328–36.
29. Swendsen JD, Merikangas KR. The comorbidity of depression and substance use disorders. Clin Psychol Rev. 2000;20(2):173–89.
30. Merikangas KR, Mehta RL, Molnar BE, Walters EE, Swendsen JD, Aguilar-Gaziola S, et al. Comorbidity of substance use disorders with mood and anxiety disorders: results of the international consortium in psychiatric epidemiology. Addict Behav. 1998;23(6):893–907.
31. Meyers JL, Dick DM. Genetic and environmental risk factors for adolescent-onset substance use disorders. Child Adolesc Psychiatr Clin N Am. 2010;19(3):465–77.
32. Steinberg L, Fletcher A, Darling N. Parental monitoring and peer influences on adolescent substance use. Pediatrics. 1994;93(6 Pt 2):1060–4.
33. Bryant AL, Schulenberg JE, O'Malley PM, Bachman JG, Johnston LD. How academic achievement, attitudes, and behaviors relate to the course of substance use during adolescence: a 6-year, multiwave national longitudinal study. J Res Adolesc. 2003;13(3):361–97.
34. Griffin KW, Botvin GJ. Evidence-based interventions for preventing substance use disorders in adolescents. Child Adolesc Psychiatr Clin N Am. 2010;19(3):505–26.
35. Jackson C, Dickinson D. Can parents who smoke socialise their children against smoking? Results from the smoke-free kids intervention trial. Tob Control. 2003;12(1):52–9.
36. Levy SJL, Williams JF. Committee on substance use and prevention. Substance use screening, brief intervention, and referral to treatment. Pediatrics. 2016;138(1):e20161211.
37. Youth.gov. https://youth.gov/youth-topics/substance-abuse/risk-and-protective-factors-substance-use-abuse-and-dependence. Accessed 24 July 2018.
38. Levy S, Campbell MD, Shea CL, DuPont R. Trends in abstaining from substance use in adolescents: 1975–2014. Pediatrics. 2018:e20173498. https://doi.org/10.1542/PEDS.2017-3498.

Chapter 3
Screening for Substance Use and Associated Medical Conditions

Jesse W. Schram, Patricia C. F. Schram, and John R. Knight

Introduction

Increased understanding of the nature and complexity of substance use by adolescents has resulted in a shift in how clinicians have conceptualized and approached the screening, assessment, and treatment process. Early onset of substance use leads to higher risk of developing psychosocial problems [1] and a substance use disorder later in adolescence or adulthood [2]. This makes screening and early intervention critical in moderating the potential trajectory of use.

Substance Use Along a Continuum

Substance use during adolescence can be viewed along a developmental continuum. Although infrequent use of substances may not have immediate social, academic, psychological, or legal consequences, there is no known safe dose of psychoactive substances on the developing adolescent brain. Consequently, clinicians should

J. W. Schram
Department of Social Work, Adolescent Substance Use and Addiction Program, Boston Children's Hospital, Boston, MA, USA

P. C. F. Schram (✉)
Department of Medicine, Boston Children's Hospital, Boston, MA, USA

Department of Pediatrics, Harvard Medical School, Boston, MA, USA
e-mail: patricia.schram@childrens.harvard.edu

J. R. Knight
Department of Pediatrics, Harvard Medical School, Boston, MA, USA

Department of Medicine and Psychiatry, Boston Children's Hospital, Boston, MA, USA

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recommend continued *abstinence* from all substances and provide appropriate education and guidance from early adolescence.

Experimentation is defined as early occasional use that does not lead to problems and *problematic substance use* as recurrent use that leads to social, psychological, and/or behavioral consequences, but does not meet criteria for a substance use disorder. Nonmedical and problematic uses of prescription medications exist along a parallel continuum of use. Nonmedical use is defined as taking a controlled substance for a reason other than which it is prescribed, at an increased dosage or by a different route than intended, or taking a controlled substance that was not prescribed for you, e.g., someone else's prescription. As for other substances, problematic use is nonmedical use of a controlled substance that results in negative consequences, dysfunction or disability, but does not meet criteria for a substance use disorder. Given the potential ease in access and low perception of risk associated with prescription medications, adolescents are particularly susceptible to experimentation and problematic use of substances within this class.

Substance Use Disorders

The *Diagnostic and Statistical Manual of Mental Disorders* (DSM) by the American Psychiatric Association provides specific criteria to guide clinicians in evaluating and diagnosing mental health and substance use conditions. Its fourth edition (DSM-IV) separately defined "substance abuse" as meeting any one of the four criteria and "substance dependence" as meeting any three of the seven criteria [3] (Table 3.1).

Among the key revisions in the fifth edition (DSM-5), released in May 2013, is the merging of the "abuse" and "dependent" diagnoses into a single diagnostic entity combining their criteria, omitting the criterion "recurrent legal problems," and adding a "craving" criterion to define "substance use disorder" (SUD), with a gradient of severity from mild (2–3 criteria), moderate (4–5 criteria), to severe (≥6 criteria) [4].

Given the well-established relationship between shame and substance use among adolescence [5], the removal of "abuse" and "dependence" and the use of less stigmatizing language could have significant implications for help-seeking behaviors. Indeed, the term "substance abuse" is outdated, may perpetuate stigma, and should no longer be used [6]. The addition of the "cravings" criterion within the DSM-5 received considerable attention. A craving is framed as "having a strong desire or urge to use a specific substance" and was purported to capture substances such as opioids and alcohol. In our experience, among adolescents, the "cravings" criterion is infrequently endorsed for certain substances (e.g., marijuana), as stereotypical perceptions of the word are often coupled with statements such as "I am not addicted." However, given the research supporting cravings as a motivator for ado-

Table 3.1 Comparing the Diagnostic Criteria of the DSM-IV-TR and DSM-5 (X indicates included criterion)

Criteria (in the last 12 months)	DSM-IV-TR Dependence *(3 or more)*	DSM-IV-TR Abuse *(1 or more)*[a]	DSM-5
Tolerance	X		X
Withdrawal	X		X
Use in larger amounts or over a longer period than was intended	X		X
There is a persistent desire or unsuccessful efforts to cut down or control substance use	X		X
A great deal of time is spent in activities necessary to obtain the substance, use the substance, or recover from its effects	X		X
Craving, or a strong desire or urge to use substance			X
Recurrent substance use resulting in a failure to fulfill major role obligations at work, school, or home		X	X
Continued use despite harm			X
Continued substance use despite having persistent or recurrent social or interpersonal problems caused or exacerbated by the effects of substance		X	X
Important social, occupational, or recreational activities are given up or reduced because of substance use	X		X
Recurrent substance use in situations in which it is physically hazardous		X	X
Use continues despite knowledge of adverse consequences (e.g., failure to fulfill role obligation, use when physically hazardous)	X		
Recurrent substance-related legal problems		X	

[a]Symptoms must never have met criteria for substance dependence for this class of substance

lescent alcohol use [7], it is important that clinicians ask if patients "really want," "need," or have a "strong urge" to use a substance. For adolescents, the cravings criterion may be particularly applicable to e-cigarettes, such as "Juuls," given that patients often describe "needing the head-rush" or feeling as though they "really want a hit between classes at school."

Additional changes on the criteria level involve the removal of the "legal problems" criterion in the DSM-5. Analyses examining the exclusion of this criterion found that most individuals diagnosed with an alcohol use disorder were unaffected by this modification and accordingly still received a DSM-5 diagnosis [8]. Furthermore, individuals who endorsed legal problems were significantly more likely to endorse two or more additional criteria, which is consistent with research suggesting low discrimination between other criteria [9]. Finally, certain populations, including communities of color, have been disproportionately affected by drug laws, and this may reflect differential policing and sentencing rather than differences in the severity of substance use disorders [10].

Confidentiality and Screening, Brief Intervention, and Referral to Treatment (SBIRT)

Confidentiality

The prevailing standard of care for adolescents beginning around 12 years of age is to meet with the patient and parent(s) together, to explain the ground rules of confidentiality, and, once everyone agrees, to ask the parent(s) to leave the room for a confidential interview regarding substance use, sexuality, and other sensitive topics. Ground rules are that the clinician will keep the adolescent's information confidential unless there is an immediate risk to safety—either the patient's or someone else's. If safety concerns arise, the clinician will discuss with the adolescent what and how information will be disclosed to the parent(s). Reviewing confidentiality and its limits not only helps to protect the therapeutic relationship [11] but also allows for the clinician and patient to strategize and collaborate around the approach of the disclosure. If the clinician feels that it's best to disclose an adolescent's substance use, then they can decide together how best to tell the parent(s), either with or without the adolescent in the room.

Federal confidentiality laws and regulations (42 CFR Part 2) apply to any practice treating substance use disorders and establish added protections to substance use treatment records. Special written consent to release information is required for the sharing of any substance-related information. This consent is different from (and generally more restrictive than) the general mental health information protected under the Health Insurance Portability and Accountability Act (HIPAA). In large part, this extra protection is designed to reduce stigma associated with substance use behaviors and disorders, decrease the potential impact/consequences that could result from access to this type of information, and increase help-seeking behaviors.

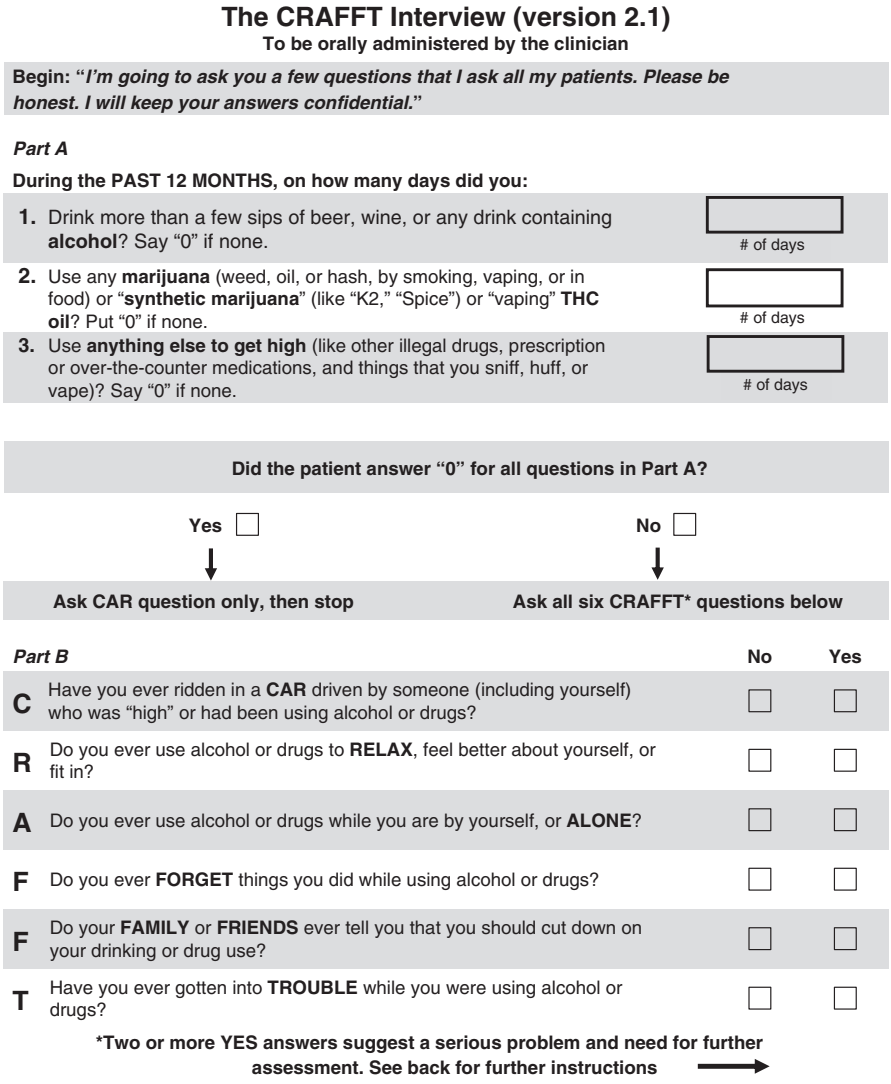
Screening

Screening is the process of identifying an individual's level of risk toward maladaptive behaviors or a clinical disorder [12]. The American Academy of Pediatrics (AAP) recommends annual screening for tobacco, alcohol, and other substance use, typically beginning at age 11 years, and suggests that pediatricians start discussing the unhealthy effects of alcohol, tobacco, and substance use as early as 9 years of age [13].

Clinical impression alone is insufficient to detect adolescents with problematic use or a substance use disorder [14]. To maximize the validity and efficacy of the screening process, it is recommended that clinicians use tools that are developmentally appropriate to adolescents. Instruments such as CAGE, RAPS4, and AUDIT remain popular among adults, but several studies point to low reliability and validity in younger persons [15–17].

CRAFFT

The optimal screening tool should be concise, easy to administer, valid, and reliable. The CRAFFT (Fig. 3.1) has become one of the most widely used tools for detecting problematic substance use among adolescents due to its substantial



The CRAFFT Interview (version 2.1)

To be orally administered by the clinician

Begin: "*I'm going to ask you a few questions that I ask all my patients. Please be honest. I will keep your answers confidential.*"

Part A

During the PAST 12 MONTHS, on how many days did you:

1. Drink more than a few sips of beer, wine, or any drink containing **alcohol**? Say "0" if none. — # of days
2. Use any **marijuana** (weed, oil, or hash, by smoking, vaping, or in food) or "**synthetic marijuana**" (like "K2," "Spice") or "vaping" **THC oil**? Put "0" if none. — # of days
3. Use **anything else to get high** (like other illegal drugs, prescription or over-the-counter medications, and things that you sniff, huff, or vape)? Say "0" if none. — # of days

Did the patient answer "0" for all questions in Part A?

Yes ☐ → **Ask CAR question only, then stop**

No ☐ → **Ask all six CRAFFT* questions below**

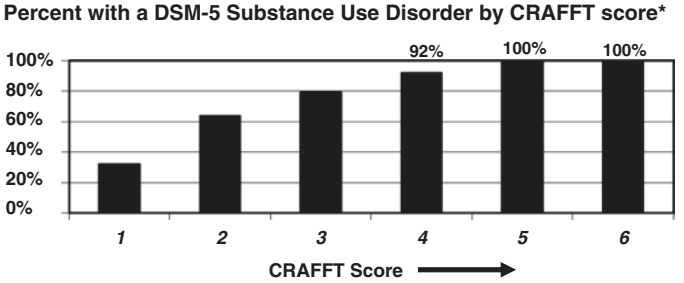
Part B		No	Yes
C	Have you ever ridden in a **CAR** driven by someone (including yourself) who was "high" or had been using alcohol or drugs?	☐	☐
R	Do you ever use alcohol or drugs to **RELAX**, feel better about yourself, or fit in?	☐	☐
A	Do you ever use alcohol or drugs while you are by yourself, or **ALONE**?	☐	☐
F	Do you ever **FORGET** things you did while using alcohol or drugs?	☐	☐
F	Do your **FAMILY** or **FRIENDS** ever tell you that you should cut down on your drinking or drug use?	☐	☐
T	Have you ever gotten into **TROUBLE** while you were using alcohol or drugs?	☐	☐

***Two or more YES answers suggest a serious problem and need for further assessment. See back for further instructions →**

NOTICE TO CLINIC STAFF AND MEDICAL RECORDS:
The information on this page is protected by special federal confidentiality rules (42 CFR Part 2), which prohibit disclosure of this information unless authorized by specific written consent. A general authorization for release of medical information is NOT sufficient.

Fig. 3.1 CRAFFT 2.1_Clinician Interview

1. Show your patient his/her score on this graph and discuss level of risk for a substance use disorder.



*Data source: Mitchell SG, Kelly SM, Gryczynski J, Myers CP, O'Grady KE, Kirk AS, & Schwartz RP. (2014). The CRAFFT cut-points and DSM-5 criteria for alcohol and other drugs: a reevaluation and reexamination. Substance Abuse, 35(4), 376–80.

2. Use these talking points for brief counseling.

1. **REVIEW** screening results
   For each "yes" response: *"Can you tell me more about that?"*
2. **RECOMMEND** not to use
   "As your doctor (nurse/health care provider), my recommendation is not to use any alcohol, marijuana or other drug because they can: 1) Harm your developing brain; 2) Interfere with learning and memory, and 3) Put you in embarrassing or dangerous situations."
3. **RIDING/DRIVING** risk counseling
   "Motor vehicle crashes are the leading cause of death for young people. I give all my patients the Contract for Life. Please take it home and discuss it with your parents/guardians to create a plan for safe rides home."
4. **RESPONSE** elicit self-motivational statements
   Non-users: *"If someone asked you why you don't drink or use drugs, what would you say?"* Users: *"What would be some of the benefits of not using?"*
5. **REINFORCE** self-efficacy
   "I believe you have what it takes to keep alcohol and drugs from getting in the way of achieving your goals."

3. Give patient Contract for Life. Available at www.crafft.org/contract

Fig. 3.1 (continued)

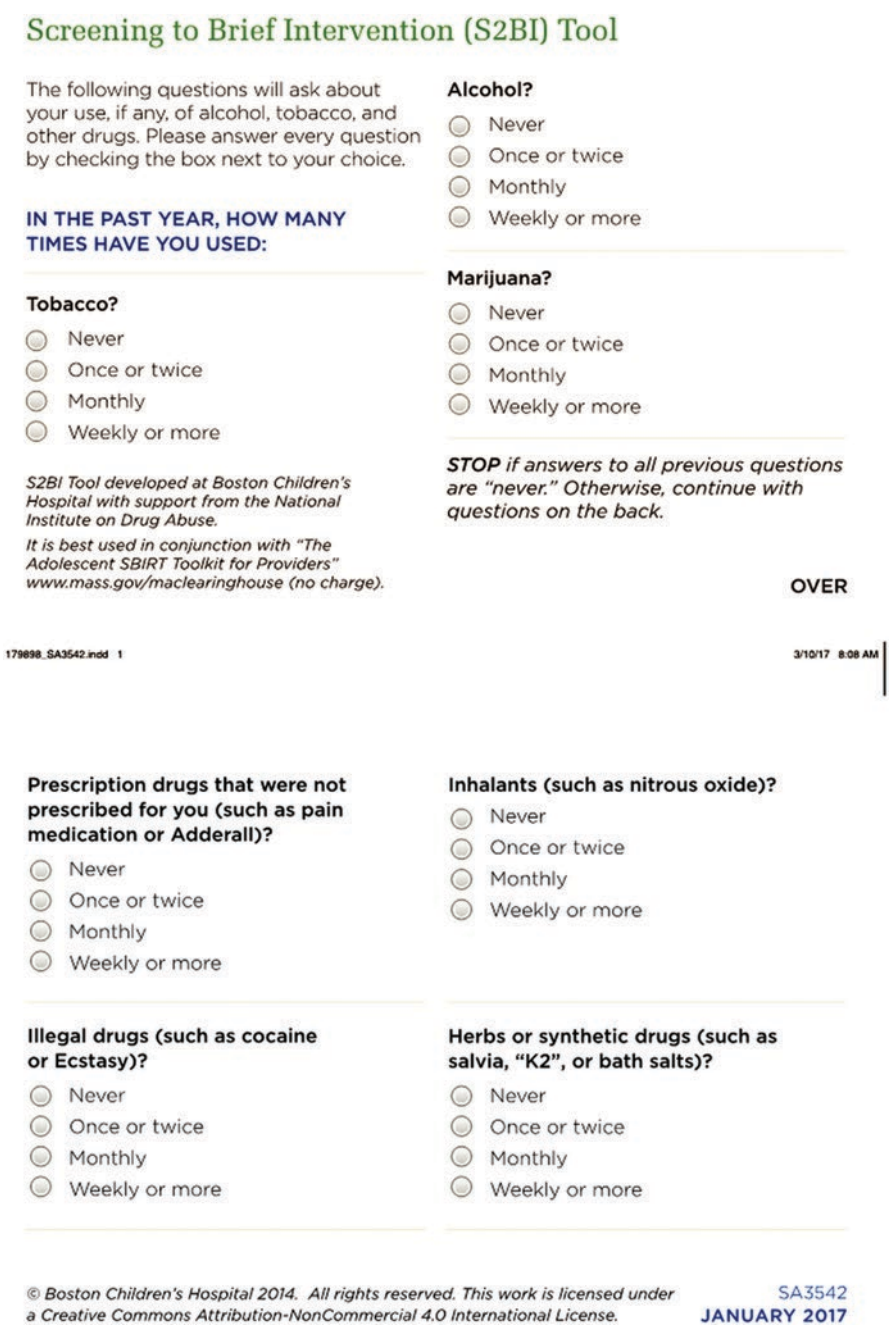
empirical support [12, 18, 19]. The CRAFFT demonstrates high reliability and sensitivity in identifying adolescents with problematic substance use and a diagnosable SUD [20]. The CRAFFT has also been validated in several other countries and languages [21–23]. (Translations of the CRAFFT are freely available at http://ceasar.childrenshospital.org/about/) (Fig. 3.1).

CRAFFT is a mnemonic acronym created from the first letters of the key domains assessed in the screening instrument (Fig. 3.1). To administer the CRAFFT, the clinician begins by asking three questions to screen for the number of days of use during the past 12 months of (1) alcohol, (2) marijuana, and (3) any other illegal or prescription medication for the purpose of getting high. If the patient reports zero days of use during the past 12 months for all three questions, the clinician follows up with the "Car" question only and provides appropriate affirmation or encouragement for continued abstinence. If the patient reports any days of use for any of the first three questions, then all six CRAFFT questions are administered.

Clinicians describe the CRAFFT as quick, reliable, and easy to administer, which makes it optimal for adolescents in a variety of settings. The first question explores an individual's substance use while directly operating a vehicle but also assesses for riding in cars whose drivers are impaired. Greater than 22.4% of primary care patients report riding in a car with an impaired driver, and in 8.2% of patients, the driver is a parent or other adult family member [24]. According to the National Center for Health Statistics, alcohol-related car crashes are the leading cause of adolescent mortality [25]. For that reason, we recommend providing adolescents and the parent(s) with the Contract for Life (free download available at http://ceasar.childrenshospital.org/contract-for-life/) to trigger a discussion around the risks associated with driving in a vehicle while intoxicated/impaired or riding with an intoxicated driver. Clinicians are encouraged to use clinical judgment to determine if safety concerns rise to the level of requiring disclosure to parents, such that the adolescent is considered a danger to himself/herself or others.

S2BI

The Screening to Brief Intervention (S2BI) instrument is also validated for use with adolescents and in one study demonstrated high sensitivity and specificity in identifying SUDs [26] (Fig. 3.2). The single screening assessment of "past-year use" is quick and effective, which allows clinicians to administer the screen in a variety of formats and settings. The instrument begins by asking a patient about his or her frequency of use of tobacco, alcohol, and/or marijuana in the past year (never, once or twice, monthly, weekly, or more). If the patient endorses use of any of the three substances, then follow-up questions are posed to target use of prescription drugs, illegal drugs, inhalants, and herbs. The frequency of use reported is strongly



Screening to Brief Intervention (S2BI) Tool

The following questions will ask about your use, if any, of alcohol, tobacco, and other drugs. Please answer every question by checking the box next to your choice.

IN THE PAST YEAR, HOW MANY TIMES HAVE YOU USED:

Tobacco?
- Never
- Once or twice
- Monthly
- Weekly or more

S2BI Tool developed at Boston Children's Hospital with support from the National Institute on Drug Abuse.

It is best used in conjunction with "The Adolescent SBIRT Toolkit for Providers" www.mass.gov/maclearinghouse (no charge).

Alcohol?
- Never
- Once or twice
- Monthly
- Weekly or more

Marijuana?
- Never
- Once or twice
- Monthly
- Weekly or more

***STOP** if answers to all previous questions are "never." Otherwise, continue with questions on the back.*

OVER

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Prescription drugs that were not prescribed for you (such as pain medication or Adderall)?
- Never
- Once or twice
- Monthly
- Weekly or more

Inhalants (such as nitrous oxide)?
- Never
- Once or twice
- Monthly
- Weekly or more

Illegal drugs (such as cocaine or Ecstasy)?
- Never
- Once or twice
- Monthly
- Weekly or more

Herbs or synthetic drugs (such as salvia, "K2", or bath salts)?
- Never
- Once or twice
- Monthly
- Weekly or more

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Fig. 3.2 The Screening to Brief Intervention (S2BI) tool

a

QUICK GUIDE:[1] Adolescent Screening, Brief Intervention, Referral for Treatment (SBIRT)

1. ADMINISTER THE SCREENING TO BRIEF INTERVENTION TOOL (S2BI).[2]

2. ACTION PLAN FOR EACH RESPONSE CATEGORY

Never:

Give positive reinforcement, and advise to never ride with someone who has used a substance.

"Once or Twice" for one or more substances:

Give brief medical advice to quit in the context of the dangers of substance use.

"Monthly" for any substance:

1. Do a brief assessment. You can use the CRAFFT questions for guidance. Follow up on any "yes" response for more detail.
2. Summarize and use conversation as a fulcrum to encourage patient to make a change plan.
3. Offer clear advice to quit.
4. Make a specific change plan and complete a change plan worksheet.
5. Schedule a follow-up appointment.

[1] This guide is most useful as a quick reference used in conjunction with the Adolescent SBIRT Toolkit for Providers which is available free of charge at www.mass.gov/maclearinghouse.

[2] S2BI is on page 10 of the Toolkit and on the S2BI Tool card.

"Weekly or more" for any substance:

1. Do a brief assessment. Use the CRAFFT questions for guidance. Follow up on any "yes" response for more detail.
2. Summarize and use conversation as a fulcrum to encourage patient to make a change plan.
3. Include clear advice to quit.
4. Make a specific change plan and complete a change plan worksheet.
5. Offer a referral.
6. Consider talking to parents.
7. Call Youth Central Intake at 617-661-3991 for help with referral.

Acute danger:

Make an immediate intervention.

1. Do a quick screen for suicidality; if present, refer to ED for evaluation.
2. Express concern about risks of substance use.
3. Assess for domestic violence before explaining the need to break confidentiality.
4. Practice with the patient what and how you will present information to parent(s).
5. Refer for an urgent evaluation (within 2-3 days). Call Youth Central Intake at 617-661-3991 for help with referral.
6. Make a verbal "safety contract" until the next appointment.
7. Talk to parents about monitoring.

Fig. 3.3 (**a**) Quick guide: adolescent screening, brief intervention, and referral to treatment (SBIRT), Boston Children's Hospital. (**b**) CRAFFT and S2BI algorithm

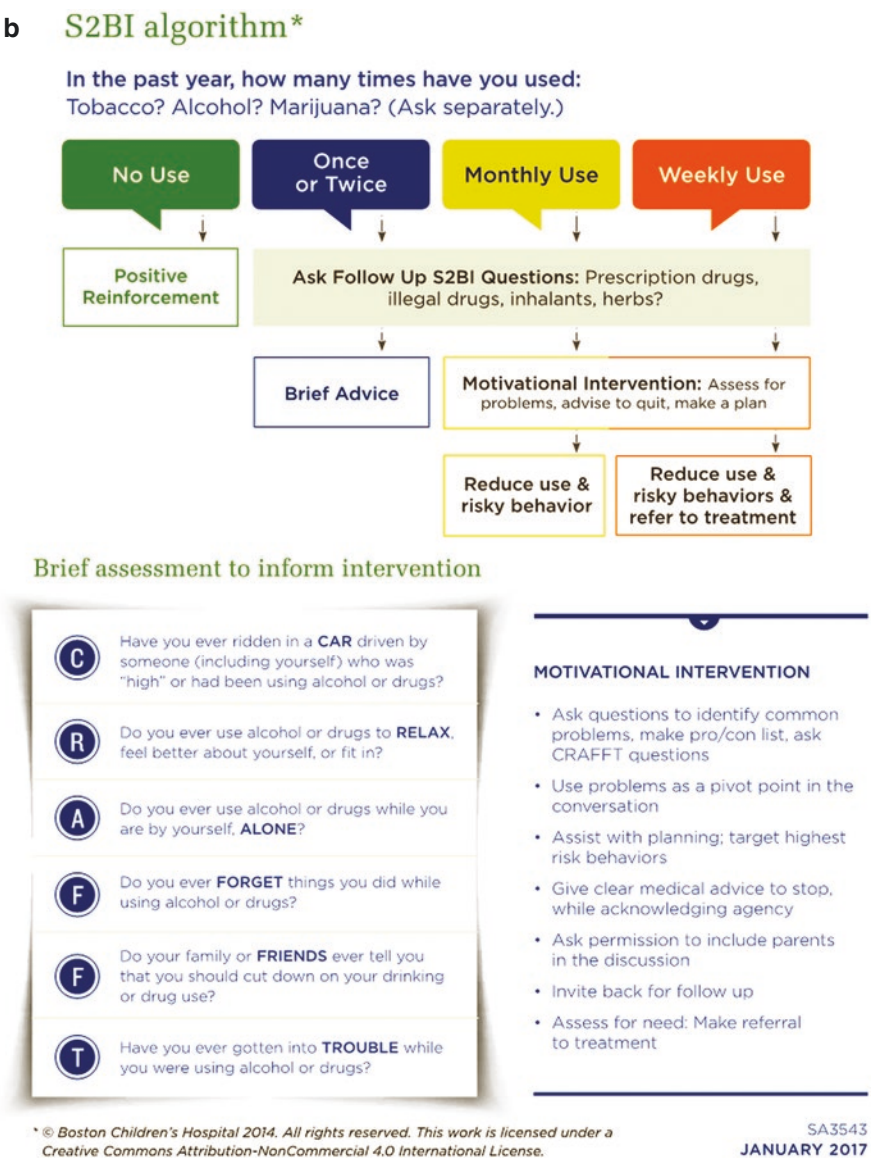

Fig. 3.3 (continued)

correlated with the likelihood of having a substance use disorder. Adolescents who report using "once or twice" in the past year are very unlikely to have a substance use disorder. Those who endorse "monthly" use will generally meet criteria for a mild or moderate substance use disorder, and those who report "weekly" use are likely to have a severe substance use disorder [27].

Brief Intervention (Fig. 3.3)

In accordance with the level of risk and severity associated with a patient's substance use, interventions may include education, brief counseling, or referral for more intensive outpatient or residential treatment services. When a moderate or severe substance use disorder is diagnosed, a mental health screening is mandatory due to the high frequency of mental health issues and disorders in patients who are using substances. Moreover, it is strongly recommended that referral to a higher level of care involves active collaboration and scheduling with the patient and agency in order to increase the likelihood of engagement in services.

In addition to the talking points listed as part of the CRAFFT in Fig. 3.1, we recommend:

- *If no reported use: Positive feedback* to delay the onset of use
- *If any use: Brief advice* to quit and *brief motivational interviewing* to reduce use and/or quit
- *If high-risk use: Refer to treatment* using motivational interviewing techniques
- *If acute safety risk: Immediate intervention*

Referral to Treatment

The clinician must be familiar with available treatment services in the community and refer to licensed mental health professionals, as indicated. Co-occurring disorders should be treated simultaneously, including attention deficit hyperactivity disorder (ADHD) and mood and anxiety disorders (e.g., depression, post-traumatic stress disorder) (for further details, see Chap. 5). Psychopharmacology consultation is warranted before initiating or continuing treatment for anxiety disorders with sedative-hypnotic drugs, such as benzodiazepines, since these medications can place adolescents at risk of somnolence, respiratory depression, or overdose and may also be misused or diverted. To prevent nonmedical use or diversion of stimulant medications when treating ADHD, parents should retain control of the prescription bottle, keep supplies locked up, and consider pill counts and directly observed consumption of pills. Limits around parental involvement should be established only if parents are unable to manage these responsibilities and/or if collaboration is ultimately disruptive toward treatment goals. In our experience, parental involvement yields better outcomes.

Below are examples of clinical situations when referral to treatment should be made immediately: (1) any patient 14 years old or younger with high-risk use; (2) daily or near daily use of any substance, at any age; (3) alcohol-related "blackout" (anterograde amnesia), or substance use-related emergency department admissions or hospital stays; (4) alcohol use combined with other sedatives (opioids, benzodiazepines); (5) taking unknown pills; and (6) intravenous drug use. More detailed information can be found in Chap. 4.

Modalities for Screening and Brief Intervention

Adolescents prefer screenings on computers or paper questionnaires over clinician interviews and may be more honest in their responses [28]. The CRAFFT has been adapted for use on an iPad, available at app.junohealth.org (only downloadable via an iPad). The app is an improved version of the computer-facilitated screening and brief advice system shown to reduce adolescents' substance use at 3 and 12 months after receiving it during an annual well-check [29]. Adolescents arriving for routine care complete the screening in a private location (out of view of their parent or guardian) before seeing their provider. They immediately receive their score and level of risk and then view ten screens of science and true-life story vignettes illustrating the potential harms of substance use. Providers receive a report with the results of the screening, level of risk, and a list of "talking points" designed to prompt 2–3 minutes of individualized counseling.

Additional Health Screening

In addition to routine yearly screening for SUDs, the AAP also recommends annual screening for depression and anxiety-related disorders. The PHQ-2 is an instrument that has demonstrated good sensitivity and specificity in detecting depression in adolescents, and its brevity allows for easy administration in primary care settings [30]. It consists of 2 questions – "Over the last 2 weeks, how often have you been bothered by any of the following problems (Not at all or Several Days or More than Half of the Days or Nearly Every Day): 'Little interest or pleasure in doing things' and 'Feeling down, depressed or hopeless'." Screening for depression should also include questions related to suicidal ideation and self-harm behaviors. Endorsement of depressive symptoms should be followed up with more in-depth screening by a mental health professional. A longer form, the PHQ-9 (which contains nine questions), is used in many settings, also.

Given the relationship between SUDs and other high-risk behaviors (i.e., unprotected sex and intravenous injection of substances), it is recommended that clinicians also screen, discuss, and treat sexually transmitted diseases (STDs) and the need for

Table 3.2 Recommended screening and medical interventions offered at first visit

Assessment of substance use disorders including tobacco use disorder
Discussion of treatment options
Laboratory tests to consider:
CBC
Chemistry
Liver function tests and lipid panel
HIV
Syphilis
Hepatitis panel (hepatitis A antibody, hepatitis B surface antibody, hepatitis B surface antigen, hepatitis C antibody)
Urine gonorrhea and chlamydia polymerase chain reaction (PCR) testing
For females: urine pregnancy test
Vaccinations[a]
Hepatitis A
Hepatitis B
Prescription for naloxone
If smoking, consider nicotine replacement therapy in addition to bupropion (under 18 years) or varenicline (18 years and older)
Depression screening

[a]Confirm lack of hepatitis B and hepatitis A immunity before vaccinating, since these vaccines are typically provided earlier in childhood

contraception and, when indicated, provide confidential counseling and testing for human immunodeficiency virus (HIV) and hepatitis C (Table 3.2). Screening and health maintenance for particularly high-risk adolescents (e.g., those who inject drugs) are covered in Chap. 11.

Laboratory testing is not recommended as a primary screening modality due to the sporadic nature of substance use by adolescents. The most common matrix used for drug tests is urine because it is easily collected and is noninvasive. However, urine samples can be easily adulterated, which may require close observation or collection by a laboratory that uses the federal collection protocol [31]. Additionally, laboratory drug testing can result in false-positive results, as well as false-negative results, which can significantly impact clinical relationships and treatment focus. If screening (immunoassays) are positive, confirmatory testing must always be done with gas chromatography and mass spectroscopy. Any drug test should only be performed if the patient is agreeable. The American Academy of Pediatrics does not recommend any drug testing without a conscious patient's knowledge and consent, and parents are not encouraged to administer drug test kits purchased from stores or the Internet because they may be unreliable [32]. Moreover, only trained clinicians should be responsible for requesting and supervising the collection of urine samples. For clinicians who are not trained to administer drug tests, we recommend taking a confidential history of substance use as the single most accurate and efficient approach.

Take-Home Points

- Always screen for substance use.
- Always ask the "Car" question from the CRAFFT screening tool, and discuss safety.
- During brief intervention, recommend abstinence as the healthiest option, since alcohol, marijuana, and other drugs may harm the developing brain, interfere with memory and learning, or place youth in embarrassing or dangerous situations.
- Always screen for commonly associated health concerns, as clinically indicated (including depression, STDs, HIV, and hepatitis C).

References

1. Poudel A, Gautam S. Age of onset of substance use and psychosocial problems among individuals with substance use disorders. BMC Psychiatry. 2017;17(1):10.
2. Bava S, Thayer R, Jacobus J, Ward M, Jernigan TL, Tapert SF. Longitudinal characterization of white matter maturation during adolescence. Brain Res. 2010;1327:38–46.
3. American Psychiatric Association. DSM-IV-TR. Diagnostic and statistical manual of mental disorders. 4th ed. Washington, DC. Substance-related disorders. 2000;191–297.
4. American Psychiatric Association. DSM-5. Diagnostic and statistical manual of mental disorders 5th ed. Substance-related and addictive disorders. 2013;481–589.
5. Rahim M, Patton R. The association between shame and substance use in young people: a systematic review. PeerJ. 2015;3:e737.
6. Kelly JF, Westerhoff CM. Does it matter how we refer to individuals with substance-related conditions? A randomized study of two commonly used terms. Int J Drug Policy. 2010;21(3):202–7.
7. Ramirez J, Miranda R. Alcohol craving in adolescents: bridging the laboratory and natural environment. Psychopharmacology. 2014;231(8):1841–51.
8. Agrawal A, Heath AC, Lynskey MT. DSM-IV to DSM-5: the impact of proposed revisions on diagnosis of alcohol use disorders. Addiction. 2011;106(11):1935–43.
9. Hasin DS, Fenton MC, Beseler C, Park JY, Wall MM. Analyses related to the development of DSM-5 criteria for substance use related disorders: 2. Proposed DSM-5 criteria for alcohol, cannabis, cocaine and heroin disorders in 663 substance abuse patients. Drug Alcohol Depend. 2012;122(1–2):28–37.
10. Slade EP, Stuart EA, Salkever DS, Karakus M, Green KM, Ialongo N. Impacts of age of onset of substance use disorders on risk of adult incarceration among disadvantaged urban youth: a propensity score matching approach. Drug Alcohol Depend. 2008;95(1–2):1–13.
11. Committee on Substance Use and Prevention. Substance use screening, brief intervention, and referral to treatment. Pediatrics. 2016;138(1):e20161210.
12. Pilowsky DJ, Wu L-T. Screening instruments for substance use and brief interventions targeting adolescents in primary care: a literature review. Addict Behav. 2013;38(5):2146–53.
13. Committee on Practice and Ambulatory Medicine, Bright Futures Periodicity Schedule Workgroup. 2017 recommendations for preventive pediatric health care. Pediatrics American Academy of Pediatrics. 2017;139(4):e20170254.
14. Wilson CR, Sherritt L, Gates E, Knight JR. Are clinical impressions of adolescent substance use accurate? Pediatrics. 2004;114(5):e536–40.

15. Kelly TM, Donovan JE, Chung T, Bukstein OG, Cornelius JR. Brief screens for detecting alcohol use disorder among 18-20 year old young adults in emergency departments: comparing AUDIT-C, CRAFFT, RAPS4-QF, FAST, RUFT-cut, and DSM-IV 2-item scale. Addict Behav. 2009;34(8):668–74.
16. Knight JR, Sherritt L, Harris SK, Gates EC, Chang G. Validity of brief alcohol screening tests among adolescents: a comparison of the AUDIT, POSIT, CAGE, and CRAFFT. Alcohol Clin Exp Res. 2003;27(1):67–73.
17. Cook RL, Chung T, Kelly TM, Clark DB. Alcohol screening in young persons attending a sexually transmitted disease clinic. Comparison of AUDIT, CRAFFT, and CAGE instruments. J Gen Intern Med. 2005;20(1):1–6.
18. Dhalla S, Zumbo BD, Poole G. A review of the psychometric properties of the CRAFFT instrument: 1999–2010. Curr Drug Abuse Rev. 2011;4(1):57–64.
19. D'Amico EJ, Parast L, Meredith LS, Ewing BA, Shadel WG, Stein BD. Screening in primary care: what is the best way to identify at-risk youth for substance use? Pediatrics. 2016;138(6):e20161717.
20. Mitchell SG, Kelly SM, Gryczynski J, Myers CP, O'Grady KE, Kirk AS, et al. The CRAFFT cut-points and DSM-5 criteria for alcohol and other drugs: a reevaluation and reexamination. Subst Abus. 2014;35(4):376–80.
21. Skogen JC, Bøe T, Knudsen AK, Hysing M. Psychometric properties and concurrent validity of the CRAFFT among Norwegian adolescents. Ung@hordaland, a population-based study. Addict Behav. 2013;38(10):2500–5.
22. Kandemir H, Aydemir Ö, Ekinci S, Selek S, Kandemir SB, Bayazit H. Validity and reliability of the Turkish version of CRAFFT substance abuse screening test among adolescents. Neuropsychiatr Dis Treat. 2015;11:1505–9.
23. Wartberg L, Kriston L, Diestelkamp S, Arnaud N, Thomasius R. Psychometric properties of the German version of the CRAFFT. Addict Behav. 2016;59:42–7.
24. Harris SK, Johnson JK, Sherritt L, Copelas S, Rappo MA, Wilson CR. Putting adolescents at risk: riding with drinking drivers who are adults in the home. J Stud Alcohol Drugs. 2017;78(1):146–51.
25. U.S. Department of Transportation, National Highway Traffic Safety Administration (NHTSA). Traffic safety facts 2014. https://crashstats.nhtsa.dot.gov/Api/Public/Publication/812261. Accessed 23 July 2018.
26. Levy S, Weiss R, Sherritt L, Ziemnik R, Spalding A, Van Hook S, et al. An electronic screen for triaging adolescent substance use by risk levels. JAMA Pediatr. 2014;168(9):822–8.
27. Subramaniam GA, Volkow ND. Substance misuse among adolescents. JAMA Pediatr. 2014;168(9):798.
28. Knight JR, Harris SK, Sherritt L, Van Hook S, Lawrence N, Brooks T, et al. Adolescents' preference for substance abuse screening in primary care practice. Subst Abus. 2007;28(4):107–17.
29. Harris SK, Csémy L, Sherritt L, Starostova O, Van Hook S, Johnson J, et al. Computer-facilitated substance use screening and brief advice for teens in primary care: an international trial. Pediatrics. 2012;129(6):1072–82.
30. Richardson LP, Rockhill C, Russo JE, Grossman DC, Richards J, McCarty C, et al. Evaluation of the PHQ-2 as a brief screen for detecting major depression among adolescents. Pediatrics. 2010;125(5):e1097–103.
31. Services USD of H and H. Mandatory guidelines for federal workplace drug testing. Subst Abus Ment Heal Serv Adm. 2004;69(71):1.
32. Levy S, Siqueira LM. Testing for drugs of abuse in children and adolescents. Pediatrics. 2014;133(6):e1798–807.

Part II
Treatment

Chapter 4
How to Navigate Different Levels of Care

Dana Sarvey

Introduction

Adolescence marks a critical time frame for early intervention and treatment initiation for substance use disorders. Over 70% of adults with a current substance use disorder retrospectively report initiation during the adolescent period [1]. Paradoxically, however, adolescence can also be the most challenging time for clinicians to effectively implement such much needed services. Complex neurobiological changes occur during adolescence, rendering the normally developing adolescent vulnerable to the initiation of risk-taking behaviors, which, for some individuals, can lead to the development of substance use disorders. However, only about 10% of adolescents who meet criteria for substance use disorder actually enroll in treatment [2]. This rate of utilization has remained consistently low over the past 20 years [3]. Further, youth who do enter treatment generally demonstrate a relapsing and remitting course, often with low retention, and only modest outcomes for those who do finish [4, 5]. Specific adolescent minority groups have an even greater risk for poorer outcomes, including low treatment completion as well as more significant long-term medical and legal complications [6].

One explanation for this paradox in treatment need versus outcome is the heterogeneity of youth who suffer from substance use disorders. Adolescents who present to treatment are often not fully motivated to make changes, even when experiencing functional impairments. The here and now can become more important than the serious health consequences that may develop from the chronic and excessive use of substances. Co-occurring mental illness also influences outcomes. Recent studies suggest that more than two-thirds of youth with substance use disorders also meet

D. Sarvey (✉)
Department of Child and Adolescent Psychiatry, McLean Hospital, Belmont, MA, USA

Harvard Medical School, Boston, MA, USA
e-mail: dsarvey@partners.org

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criteria for a second (and sometimes third and fourth) co-occurring mental health disorder [7, 8], rendering dual diagnosis the rule rather than the exception. Treatment outcomes are also poorer for those with co-occurring psychiatric conditions, even at higher levels of care [9]. Matching adolescents with personalized and prescribed plans for treatment creates an opportunity for providers to increase the likelihood of successful engagement for their patients. These meaningful interventions can often lead to significant change or alteration in life trajectory. Although co-occurring mental health disorders are reviewed in greater depth in Chap. 5, here we discuss them in the context of navigating different levels of care for substance use disorders.

Assessment for Appropriate Treatment

Quality treatment planning begins with a thorough substance use history and safety assessment. The following table provides a means of organizing the different risk factors involved in a multidimensional assessment (Table 4.1). Many, but not all, of the risk factors listed in Table 4.1 are consistent with the American Society of Addiction Medicine (ASAM) consensus guidelines for assessment.

Generally, the more significant the degree of impairment found in each category, the greater the need for a higher level of care. A thorough evaluation begins

Table 4.1 Multidimensional components of a thorough safety assessment

	Degree of impairment		
Risk factors	Mild	Moderate	Severe
Frequency of use	Monthly or less	Weekly	Daily or near-daily
Intoxication/ withdrawal	None, or only mild symptoms	Moderate symptoms	Severe/life-threatening
Co-occurring medical conditions	None, or mild	Moderate (stable and/or controlled medical conditions)	Severe (unstable and/or uncontrolled medical conditions)
Comorbid psychiatric illness/ suicidality	None, or mild	Moderate (stable comorbid illnesses)	Severe (ongoing suicidality, borderline personality disorder, bipolar illness, PTSD)
Ambivalence	Low (very motivated for treatment)	Moderate (some ambivalence)	High (denial of difficulties and/or strong ambivalence)
Family/social environment	Supportive and resourceful family, stable school environment	Mildly supportive, fewer resources, school difficulties	Nonsupportive (homelessness, child and family services involvement, out of school)
Likelihood of relapse/ unintentional overdose	Low (steady use patterns with single substance)	Moderate (use of multiple substance types)	High (intravenous drug use, opioid use, methamphetamine use, use of multiple substances)

with quantitative information about what substances are being used, the frequency of use, as well as inquiring about any legal or functional difficulties. Although adolescents with substance use disorders are less likely than adults to present for treatment with medical complications and signs of withdrawal from their substance use, they are more likely to be misusing more than one primary substance [10]. Adolescents are also more likely to hide or minimize their use compared to adults and tend to continue their use despite adverse legal or psychosocial consequences [11]. Collateral history from caregivers is also essential for this reason, given adolescents' possible reticence in being forthright in acknowledging their struggles.

Although fortunately relatively rare in adolescents, signs of physiological withdrawal can demonstrate the need for detoxification within a hospital setting. This is particularly true for withdrawal from alcohol or benzodiazepines, which can be life-threatening. It is also important to consider co-occurring physical health conditions. Many of these conditions can impact a patient's ability to safely receive treatment within an outpatient setting. Co-occurring psychiatric illness also poses additional safety risk for adolescents who are already at increased risk by virtue of their substance use. Evaluating an adolescent's motivation for treatment is another dimension to consider, with the degree of motivation to change having been correlated with the success of treatment [12]. Family and social supports can also be an integral part of determining the appropriate level of care.

Drug overdose is currently and alarmingly a leading cause of unintentional death among adolescents and young adults within the United States [13]; however, it is important to consider not only the immediate risk of overdose but also the degree to which an adolescent might be experiencing concomitant suicidality. The combination of potentially lethal substance use (such as opioid use) along with ongoing suicidal thinking and/or ambivalence around safety places many adolescents at much greater risk. Conversely, a history of even mild substance use rises to a greater level of importance for those with a co-occurring history of self-harm and suicide attempts, as they may be more likely to attempt or self-harm when acutely intoxicated.

General Principles of Treatment

Individual assessment is followed by the development of a treatment plan, which includes matching the adolescent with an appropriate level of care. Some general principles of adolescent substance use treatment to consider are listed below [11]:

1. Addressing any substance use, even if it does not qualify as a disorder, should be a primary goal of all providers who work with adolescents. (Providing brief interventions for adolescents who use substances is covered in Chap. 3.)
2. No single treatment or combination of evidenced-based treatments will be appropriate for all adolescents.

3. Treatment is primarily behaviorally based. However, treatment with medication is warranted and highly effective in cases of significantly impairing substance use and/or with the treatment of opioid use, tobacco use, and alcohol use disorders. (Medication treatment for substance use disorders is reviewed in Chap. 7.)
4. Concomitant treatment of comorbid psychiatric disorders yields better outcomes [14]. (Management of co-occurring mental health disorders is discussed in Chap. 5.)
5. Treatment of adolescent substance use disorders should be considered a chronic illness with relapsing and remitting features in which individuals may oscillate between different levels of care.
6. Effective treatment takes time. The longer the duration of treatment, the more sustained and positive the outcomes tend to be, and retention in care is associated with improved treatment outcomes [15].
7. Relapse is an opportunity for additional support to be put in place and/or indicates that the current level of care might not match the need.

Levels of Care

The American Society of Addiction Medicine (ASAM) has created an evidenced-based consensus model of progressive levels of treatment for adolescents, which can serve as a framework to consider when evaluating placement options (Fig. 4.1).

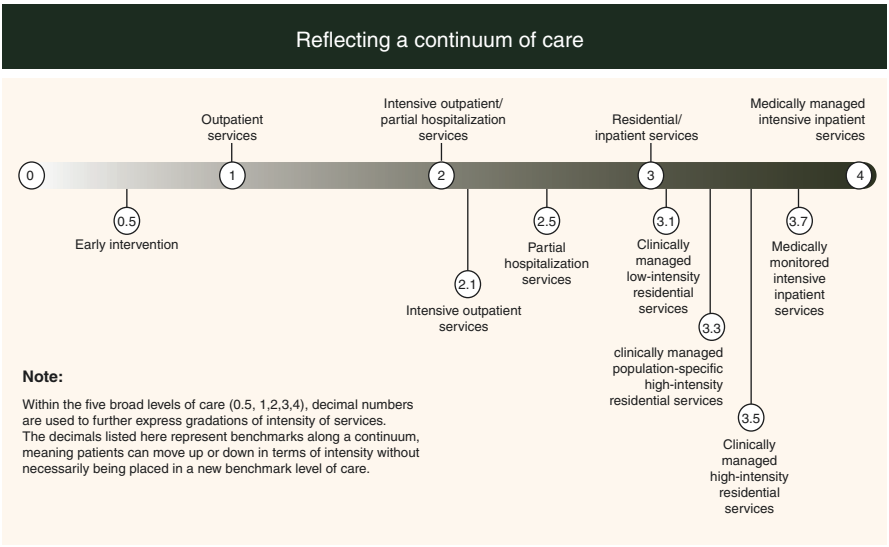

Fig. 4.1 ASAM Levels of Care. (Used with permission of the American Society of Addiction Medicine. Mee-Lee D. The ASAM criteria: treatment criteria for addictive, substance-related, and co-occurring conditions. 3rd ed. American Society of Addiction Medicine; 2013)

A summary of various points along this continuum is described below. The concept behind the model is that patients move between different levels of care, depending on the need. The goal of treatment is to help patients stabilize and reduce their use. Although abstinence is the most beneficial from a medical perspective, reduction of use may be a more realistic expectation for many adolescents.

Early Intervention

Exposure to substances among adolescents should be delayed for as long as is possible, given the strong likelihood of developing an addiction during this time period, with increasing severity of illness being associated with age at first use [16, 17]. Intervention can be implemented with adolescents who have not yet initiated any substance use, in the form of preventative education and reinforcement strategies. This should be primarily focused on a positive reinforcement approach, such that the adolescent feels empowered and informed. Make sure to commend adolescents on their choice not to use. As soon as an adolescent is identified as having experimented with substances, which can typically begin with tobacco and/or cannabis use, a treatment-tailored approach should commence.

Outpatient Services

Most adolescents with substance use disorders receive treatment at the outpatient level of care. Outpatient treatment has been shown to be clinically effective for most adolescents with mild to moderate substance use disorders, particularly when they are diagnosed with a single use disorder (76% of youth under age 18 identify cannabis as their primary substance) [18]. About a third of adolescents entering treatment achieve sustained abstinence after 12 months, while about half reduce their use, as compared to pretreatment usage levels [19, 20]. The degree of substance use prior to treatment, the level of functional impairment, and the socioeconomic (level of household income) profile of the adolescent are all associated with response to treatment [21]. These variables should be taken into consideration when determining whether outpatient level of care would be successful for a particular adolescent. Although it is impossible to recommend a general prescribed length of treatment for all patients, most studies support treatment lasting at least 3 months for effective long-term outcomes [15].

The mainstay of outpatient psychotherapy treatment for adolescents with substance use typically involves a cognitive behavioral therapy (CBT) framework. Both group and individual CBT have been shown to be moderately effective [22, 23]. CBT focuses on providing adolescents with a structure through which to understand their behaviors and usage patterns, as well as how to manage their urges through structured plans of coping. CBT is often combined with motivational interviewing

(MI) or motivational enhancement treatment (MET), an interviewing technique which attempts to maximally engage the adolescent in a discussion around their ambivalence in changing their usage habits. MI/MET can be considered for those adolescents with lower motivation to change their use on assessment, and/or with certain co-occurring psychiatric illness, as a means of increasing engagement. Typically, outpatient treatment is delivered on a weekly basis, and the cost of 3 months of outpatient treatment on average ranges from $900 to $4000, depending upon the modality used [23]. (These modalities and others are discussed in greater detail in Chap. 6.)

Family involvement is also crucial. Increased parental involvement in an adolescent's treatment has consistently been found to lead to a decrease in substance use patterns for youth [10]. Parental involvement can take many forms, including increased limit setting, closer monitoring of an adolescent's activities and time with peers, and providing rewards for treatment adherence. There are various forms of family therapy that can support this process and that are effective with adolescents. In fact, several well-designed outcome studies support family treatment to be superior to outpatient group treatment, especially for younger adolescents (ages 11–15) [24]. A newer approach, called Adolescent Community Reinforcement Approach (ACRA), incorporates both individual CBT components and a family-based intervention and has been successful with adolescents suffering from a broad range of symptom severity [25] (ACRA is described in greater detail in Chap. 6, as well as Chap. 16).

Case management and recovery support services can also serve important adjunctive functions within the outpatient realm. Case management can help provide continuity of care for adolescents with moderate usage habits, but a less supportive home environment. A 12-step recovery support, including Alcoholics Anonymous (AA) and Narcotics Anonymous (NA), demonstrates modest efficacy for adolescent substance use disorders. Recovery support seems the most effective for youth who are motivated to reduce their use and have specific treatment goals [26]. Contingency management, a method of providing immediate, external incentives (e.g., gift cards or other prizes) for negative urine screens and treatment compliance (positive reinforcement), has been demonstrated to improve adherence to outpatient treatment and further reduce use, beyond CBT alone [27].

Intensive Outpatient/Partial Hospitalization

Adolescents who have more serious substance use (moderate to severe) but who can still be safely managed within the home environment and have no immediate medical, safety, or withdrawal complications would be appropriate for either an intensive outpatient program or partial hospitalization program. Intensive outpatient programs tend to run 2–3 days per week, for at least 2–3 h per session, and offer a variety of psychotherapy services, including CBT (group and individual treatment), motivational interviewing, case management, 12-step programming, and family

support. Partial hospital programs or "day treatment" programs run the duration of the day (4–6 h), 5 days per week. Partial hospital programs tend to be more structured, have a stronger group component, and allow for closer medical monitoring.

One factor which may help determine whether an adolescent is better served to attend an intensive outpatient program versus a partial hospital program is the level of support and engagement within the school setting. If the adolescent has recently been hospitalized or is not currently attending school regularly, a partial hospital program may be most beneficial. Treatment outcomes for intensive outpatient programs and partial hospitalizations have not been well measured. The few studies which exist demonstrate comparable rates of reduction in use between partial hospitalization and inpatient treatment [28]. The cost of an intensive outpatient program and partial treatment varies widely by region but is estimated to be between $3000–$10,000 for 30 days of intensive outpatient treatment and $350–$700 per day for a partial hospital program. Such programs are typically covered by most health insurance plans [29].

Residential Inpatient Services

Residential treatment can be divided into short-term, acute residential treatment (less than 30 days) and long-term residential treatment (greater than 30 days). Acute residential treatment provides 24-h mental health support in a fully licensed, secure hospital or community setting. There is close monitoring by trained mental health professionals, but not necessarily 24-h nursing and medical (MD) supervision that there would be on an inpatient unit. Programming generally consists of a structured combination of individual and group psychotherapy (most commonly CBT), milieu treatment, family treatment, attendance at 12-step meetings, and intensive psychiatric monitoring. This level of care is most appropriate for adolescents with moderate to severe substance use, heavier use of multiple substances, high risk use and/or suicidality, and those who do not have a supportive home or school environment. Many residential treatment programs offer dual diagnosis programming for those with co-occurring psychiatric disorders. Evidence supports such a model of treatment as being superior in quality, when compared to programs that do not provide such encompassing benefits [14]. The efficacy of residential treatment in reducing adolescent substance use patterns has been substantiated [30], though specific outcome data has not been rigorously collected across different types of residential settings, in order to make appropriate comparisons. Of note, some acute residential programs are licensed to perform detoxification as well as intensive treatment and offer stepped levels of care, starting with acute management through transitional living. The cost of residential services varies. Acute residential programs tend to cost approximately $500–$1500 per day, while longer-term residential treatment might cost upward of $25,000–$40,000 for up to 12 weeks [29]. Many insurance plans will cover residential stays with appropriate documentation supporting this level of care.

Medically Managed, Intensive Inpatient Treatment

Detoxification is defined as the medical/pharmacological management of symptoms of withdrawal, caused by exogenous substance use. There are specialized units which provide 24-h detoxification treatment, typically within a hospital setting. This level of care is indicated for adolescents who demonstrate symptoms of acute withdrawal (e.g., opioid use disorders commonly produce obvious withdrawal symptoms) or who are very likely to demonstrate hazardous withdrawal based on usage patterns (such as consistent alcohol and benzodiazepine use that could result in seizures). Treatment typically lasts 3–7 days. Once an adolescent completes detoxification, further treatment is typically needed, and adolescents may step down to either a short-term residential unit or a partial hospital program.

Adolescents presenting as acutely suicidal, and simultaneously in withdrawal, pose unique challenges. In most cases, it is recommended that the adolescent be stabilized within an inpatient dual diagnosis setting, if accessible. Many child and adolescent psychiatrists within psychiatric inpatient units have the capability of commencing treatment with medications, such as buprenorphine-naloxone for opioid use disorder, if needed.

Facilitating Referrals

Navigating Insurance Coverage

One of the largest impediments to treatment is often locating appropriate treatment facilities or providers which are covered within the network of an insurance plan. The best way of assuring that a treatment or provider is considered in network is to look at the individual website for the insurance company, where they list providers and covered levels of care. Some insurance companies also provide free case management services that can assist with the location of certain treatment facilities or providers, if it is not easily found on the website.

Insurance typically provides coverage for in-network outpatient individual therapy, group therapy, intensive outpatient programs, partial hospital programs, and acute residential treatment. Long-term residential treatment is often not covered. Because many residential programs for adolescent substance use are graded (offering several levels of care within the same facility), treatment facilities will frequently advertise that insurance will cover the cost of treatment. However, coverage is often only provided for the first component of treatment, considered to be the acute residential level of care. Insurance companies may also pay for "out-of-network" benefits when there is no in-network treatment facility that is deemed appropriate for what is clinically recommended.

Despite federally established mental health parity laws, disparities in treatment coverage persist. Obtaining appropriate insurance authorization is variable,

depending upon the insurer and region, but all insurers require patients to meet medical necessity for that level of care. However, medical necessity guidelines vary, depending on the level of care requested, as well as the specific insurance company. It is important to emphasize the safety concerns, risk of relapse, and/or risk of overdose when advocating for a higher level of care. When in doubt, always ask what the criteria are to determine medical necessity for a particular level of care, and then try and present your best clinical argument, based on the company's specific definitions.

Locating Providers

Table 4.2 lists several professional and governmental organizations which provide updated web-based resources and search engines for locating specific providers and treatment programs within the United States.

Take-Home Points

1. With a relatively low percentage of adolescents with substance use disorders currently enrolled in treatment, treatment planning represents an area of unique opportunity where providers can often make a significant difference in helping to engage youth.
2. Utilizing an evidence-based, multidimensional assessment can be a useful tool for determining which level of care is the most appropriate.
3. Treatment planning should take into consideration that adolescent substance use disorders are often insidious and chronic in nature and can be relapsing

Table 4.2 Web-based resources

The Substance Abuse and Mental Health Services Administration (SAMHSA)	Government website to locate outpatient, residential, and inpatient treatment programs within the United States	findtreatment.samhsa.gov 1-800-662-HELP
The Partnership for Drug-Free Kids	Nonprofit organization with resources on teen drug use and treatment programs for parents	drugfree.org 1-855-378-4373
The American Academy of Addiction Psychiatry	Professional organization specializing in addictions treatment (website offers information on locating providers and medication-assisted treatment under "find a specialist" tab)	aaap.org
The American Academy of Child and Adolescent Psychiatry	Professional organization specializing in child and adolescent psychiatry (website offers physician locator services)	aacap.org

and remitting in their course. Treatment is provided on a continuum and focuses on reduction of use.
4. Utilizing available insurance-based, professional, and governmental resources can help provide a variety of treatment options to patients and their families, within the constraints of the current system.

References

1. Substance Abuse and Mental Health Services Administration. Treatment Episode Data Set (TEDS): 2002–2012. National admissions to substance abuse treatment services. Rockville: Substance Abuse and Mental Health Services Administration; 2014. BHSIS Series S-71, HHS Publication No. (SMA) 14–4850.
2. Substance Abuse and Mental Health Services Administration. Results from the 2009 national survey on drug use and health: summary of national findings. Office of Applied Statistics; Rockville: 2010. NSDUH Series H-38A, HHS Publication No. (SMA) 10-4586.
3. Ilgen M, Schulenberg J, Kloska D, et al. Prevalence and characteristics of substance use treatment utilization by US adolescents: national data from 1987 to 2008. Addict Behav. 2011;36(12):1349–52.
4. Waldon H, Slesnick N, Brody J, et al. Treatment outcomes for adolescent substance abuse at 4- and 7-month assessments. J Consult Clin Psychol. 2001;69(5):802–13.
5. Miller W, Walters S, Bennett M. How effective is alcoholism treatment in the United States? J Stud Alcohol Drugs. 2001;62:211–20.
6. Saloner B, Carson N, Le Cook B. Explaining racial/ethnic differences in adolescent substance abuse treatment completion in the United States: a decomposition analysis. J Adolesc Health. 2014;54:646–53.
7. Grella C, Her Y, Joshi V, et al. Drug treatment outcomes for adolescents with comorbid mental and substance use disorders. J Nerv Ment Dis. 2001;189:384–92.
8. Chan YF, Dennis ML, Funk RR. Prevalence and comorbidity of major internalizing and externalizing problems among adolescents and adults presenting to substance abuse treatment. J Subst Abus Treat. 2008;34(1):14–24.
9. Kennedy B, Minami M. The beech hill hospital/outward bound adolescent chemical dependency treatment program. J Subst Abus Treat. 1993;10(4):395–406.
10. Han B, Compton W, Blanco C, et al. National trends in substance use and use disorders among youth. J Am Acad Child Adolesc Psychiatry. 2017;56(9):747–54.
11. NIDA. Principles of adolescent substance use disorder treatment: a research-based guide. National Institute on Drug Abuse website. Available from: https://www.drugabuse.gov/publications/principles-adolescent-substance-use-disorder-treatment-research-based-guide. January 14, 2014. Accessed 7 Jan 2018.
12. Dow SJ, Kelly JF. Listening to youth: adolescents' reasons for substance use as a unique predictor of treatment response and outcome. Psychol Addict Behav. 2013;27(4):1122–31.
13. Rudd RA, Seth P, David F, et al. Increases in drug and opioid-involved overdose deaths — United States, 2010–2015. MMWR. 2016;65:1445–52.
14. Ramchand R, Griffin B, Hunter S, et al. Provision of mental health services as a quality indicator for adolescent substance abuse treatment facilities. Psychiatr Serv. 2015;66:41–8.
15. Hser Y, Grella C, Hubbard R, et al. An evaluation of drug treatments for adolescents in 4 US cities. Arch Gen Psychiatry. 2001;58(7):689–95.
16. Anthony J, Petronis K. Early onset drug use and risk of later drug problems. Drug Alcohol Depend. 1996;40(1):9–15.
17. Dennis M, Babor T, Roebuck C, et al. Changing the focus: the case for recognizing and treating cannabis use disorders. Addiction. 2002;97(S1):4–15.

18. Tanner-Smith E, Wilson S, Lipsey M. The comparative effectiveness of outpatient treatment for adolescent substance abuse: a meta-analysis. J Subst Abus Treat. 2013;44(2):145–58.
19. Brown S, Vik P, Creamer V. Characteristics of relapse following adolescent substance abuse treatment. Addict Behav. 1989;14(3):291–300.
20. Williams R, Chang S. A comprehensive and comparative review of adolescent substance abuse treatment outcome. Clin Psychol Sci Pract. 2000;7(2):138–66.
21. Babbin S, Stanger C, Scherer E, et al. Identifying treatment response subgroups for adolescent cannabis use. Addict Behav. 2016;59:72–9.
22. Macgowan M, Engle B. Evidence for optimism: behavioral therapies and motivational interviewing in adolescent substance abuse treatment. Child Adolesc Psychiatr Clin N Am. 2010;19(3):527.
23. Dennis M, Godley S, Diamond G, et al. The cannabis youth treatment (CYT) study: main findings from two randomized trials. J Subst Abus Treat. 2004;27:197–213.
24. Liddle H, Rowe C, Dakof G, et al. Early intervention for adolescent substance abuse: pretreatment to posttreatment outcomes of a randomized clinical trial comparing multidimensional family therapy and peer group treatment. J Psychoactive Drugs. 2004;36(1):49–63.
25. Slesnick N, Prestopnik J, Meyers R, et al. Treatment outcome for street-living, homeless youth. Addict Behav. 2007;32(6):1237–51.
26. Kelly J, Dow S, Yeterian J, et al. Can 12-step group participation strengthen and extend the benefits of adolescent addiction treatment? A prospective analysis. Drug Alcohol Depend. 2010;110(1–2):117–25.
27. Stanger C, Ryan S, Scherer E, et al. Clinic- and home-based contingency management plus parent training for adolescent cannabis use disorders. J Am Acad Child Adolesc Psychiatry. 2015;54:445–53.
28. Cornwall A, Blood L. Inpatient versus day treatment for substance abusing adolescents. J Nerv Ment Dis. 1998;186:482–580.
29. French M, Popovici I, Tapsell L. The economic costs of substance abuse treatment: updated estimates and cost bands for program assessment and reimbursement. J Subst Abus Treat. 2008;35(4):462–9.
30. Morral A, McCaffrey D, Ridgeway G. Effectiveness of community-based treatment for substance-abusing adolescents: 12-month outcomes of youths entering Phoenix academy or alternative probation dispositions. Psychol Addict Behav. 2004;18(3):257–68.

Recommended Reading

Belendiuk K, Riggs P. Treatment of adolescent substance use disorders. Curr Treat Options Psychiatry. 2014;1:175–88.

Mee-Lee D. The ASAM criteria: treatment criteria for addictive, substance-related, and co-occurring conditions. 3rd ed. Chevy Chase: American Society of Addiction Medicine; 2013.

Mericle A, Arria A, Meyers K, Cacciola J, Winters K, Kirby K. National trends in adolescent substance use disorders and treatment availability: 2003-–2010. J Child Adolesc Subst Abuse. 2015;24(5):255–63.

NIDA. Principles of adolescent substance use disorder treatment: a research-based guide. National Institute on Drug Abuse website. Available from: https://www.drugabuse.gov/publications/principles-adolescent-substance-use-disorder-treatment-research-based-guide. January 14, 2014. Accessed 21 Jan 2018.

Chapter 5
Co-occurring Mental Health Disorders

Valeria Tretyak and Justine W. Welsh

Introduction

Adolescents with mental health disorders are at increased risk for the development of problematic substance use [1]. Results from the National Comorbidity Survey indicate that up to 67% of adolescents with substance abuse or dependence have experienced at least one prior mental health disorder [2]. By the time adolescents reach age 18, as many as one-third will have used illicit drugs or regularly consumed alcohol [2]. In turn, adolescents who use substances are more likely to develop new psychiatric disorders or exacerbate pre-existing mental health symptoms [3]. In practice, the clinical picture may be difficult to interpret, with substance use (or withdrawal from substances) potentially creating specific psychiatric symptoms, such as the sensation of panic, anxiety, or anhedonia. However, many individuals with a substance use disorder meet criteria for a co-occurring mental health disorder or have a pre-existing primary mental health condition. The term "co-occurring disorders" refers to conditions that exist at the same time, such as an alcohol use disorder (AUD) and a concurrent diagnosis of generalized anxiety disorder (GAD). A synonymous term that is often used is "dual diagnosis."

Treatment of co-occurring mental health disorders is especially important due to their detrimental influence on substance use. Even untreated mental health

V. Tretyak
Department of Psychology, The University of Texas at Austin, Austin, TX, USA

Department of Psychiatry, Dell Medical School at The University of Texas at Austin, Austin, TX, USA

J. W. Welsh (✉)
Department of Psychiatry and Behavioral Sciences, Emory University School of Medicine, Atlanta, GA, USA
e-mail: Justine.Welsh@emory.edu

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symptoms not meeting full diagnostic criteria for a disorder can negatively impact the course of treatment for substance use. In these cases, treatment planning can be difficult due to the unidentified etiology of existing mental health symptoms. Symptoms of substance use often mimic mental health disorders, with practitioners having historically voiced their inability to effectively diagnose a co-occurring mental health condition prior to the achievement of full abstinence. As a result, the treatment field focused on achieving full abstinence prior to treatment initiation for any co-occurring mental health symptoms. However, delaying treatment for a co-occurring mental health condition could impede successful SUD recovery. For this reason, it is now more common, and strongly advised, to treat co-occurring conditions in tandem.

Epidemiology

Major Depressive Disorder

Approximately 30% of adolescents with a SUD have experienced a major depressive episode in the last year [4]. There is also a 20–30% co-occurrence rate for SUDs and depression [1]. A diagnosis of major depressive disorder (MDD) may be particularly challenging to make in adolescents who have been identified as using substances. Depression is typically characterized by a depressed mood or loss of interest, as well as potential feelings of guilt, hopelessness, sleep disturbances, appetite changes, poor concentration, low energy, and even thoughts of death [5]. Although the same criteria for a diagnosis are used in both adults and adolescents, adolescents often present with prominent irritability instead of a sad or low mood. Additionally, behaviors that support the secrecy and consumption of substances, such as isolation, irritability, and sleep disturbances, can be confused with symptoms of depression. Finally, a strained parental/adolescent relationship may also influence symptoms perceived by caregivers.

Anxiety Disorders

Research linking substance use and anxiety disorders is limited and has provided mixed data. Specifically, some studies have found that anxiety symptoms can be protective against substance use in some adolescents while still posing as a risk factor for future substance use in others [6]. Social anxiety disorder (SAD), for example, has been found to be highly associated with AUDs and post-traumatic stress disorder (PTSD) [7]. In a population of adolescents and young adults seeking substance-specific treatment, having any anxiety-related diagnosis was significantly associated with opioid use [8]. More specifically,

individuals with opioid use were more than three times as likely to meet criteria for a diagnosis of GAD. Similarly, those with cocaine use were also more than three times as likely to meet criteria for PTSD [8].

Bipolar Disorder

Research suggests that up to 48% of individuals with bipolar disorder (BD) have a co-occurring substance use diagnosis [9]. However, there is a paucity of empirical data investigating potential risk factors for this high co-occurrence rate, and it remains unclear whether BD more commonly precedes substance use in this population or vice versa. Overall, BD in adolescents has been linked with higher rates of suicide attempts, hospitalizations, and significant functional impairment [10]. Substance use has a well-known relationship with poorer medication adherence and worse treatment outcomes in individuals with BD.

Psychosis

Increased rates of substance use, particularly alcohol, tobacco, and cannabis, are also found in youth at risk for psychosis. Early exposure, heavy use, and higher potency of marijuana used have been associated with worse disease progression in schizophrenia and other psychotic illnesses [11]. It is important to consider the consequences of continued substance use on psychosis recurrence in youth whose co-occurring SUD remains untreated [12]. This highlights the need for timely identification and implementation of early intervention strategies that can improve future physical and mental health outcomes.

Disruptive Behavior Disorders and ADHD

Externalizing disorders such as oppositional defiant disorder (ODD) and conduct disorder (CD) in adolescents commonly present with a co-occurring SUD. Evidence suggests that externalizing disorders can both follow and precede substance use in this population. Externalizing disorders that are present in childhood serve as relatively good predictors for the future initiation of substance use in both genders [13]. This highlights the importance of early identification and treatment for externalizing disorder symptoms. Rather than attributing substance use to the development of deviant behaviors, in certain circumstances it may be important to conceptualize substance use as a manifestation of a pre-existing externalizing disorder [13].

In adolescents, the strongest associations between substance use and externalizing disorders in the absence of any internalizing problems (i.e., anxiety or depression) have been found for cigarette, alcohol, and marijuana use [14].

Attention deficit hyperactivity disorder (ADHD) has been reported to occur in as many as 38% of adolescents with a cannabis use disorder [15]. The relationship between ADHD and the use of nicotine, cocaine, alcohol, and other substances in adolescents is also well documented but rarely linear in nature. Research suggests that this co-occurrence often operates through other psychiatric externalizing and internalizing conditions such as ODD and CD, or depression [16, 17]. Subsequently, it is important to monitor youth presenting with ADHD and co-occurring substance use for additional externalizing and internalizing conditions.

Assessment

Adolescents who are using substances are often excluded from studies examining treatment options for primary mood disorders, leaving minimal research as to the most effective treatment options for this population. Clinicians may also be less likely to diagnose a SUD when there are no developmentally appropriate treatment resources available for referral. Some families carry stigma toward such diagnoses, thereby limiting full disclosure of symptoms or negatively influencing their desire to seek a clinical assessment. Similarly, cultural beliefs, socioeconomic status, service availability, and racial/ethnic minority status can further pose barriers against adequate identification of individuals with co-occurring mental health disorders and SUDs, often due to historic disparities in mental healthcare delivery [18].

There are no widely used, evidence-based screening tools specifically tailored for adolescents suspected of having overlapping substance use and mental health concerns. However, there are a number of standardized screening tools for adolescent substance use that are covered in detail in Chap. 2, as well as standardized measures (reviewed below) that can assist in diagnosing mental health disorders. The 5th edition of the *Diagnostic Statistical Manual of Mental Disorders* [5] outlines criteria for known substance use and psychiatric diagnoses. It is important to distinguish a co-occurring mental health condition from a substance-induced mental disorder. While a person can meet criteria for a SUD and a co-occurring mental health disorders at the same time, the diagnosis of a substance-/medication-induced mental disorder requires an understanding of the temporal relationship of symptom onset.

Evidence of an independent mental disorder could include the following: (1) the disorder preceded the onset of severe intoxication or withdrawal or exposure to the medication; or (2) the full mental disorder persists for a substantial period of time (>1 month) after the cessation of acute withdrawal or severe intoxication. This criterion does not apply to substance-induced neurocognitive disorder or hallucinogen-persisting perception disorder, which persists beyond the cessation of acute intoxication or withdrawal [5]. In clinical practice, mood symptoms directly related to substance use usually improve or resolve within 4 weeks of abstinence. It is

Table 5.1 Psychiatric screening/assessment tools for substance use and other mental health conditions in adolescents

Examples of psychiatric screening/assessment tools
Substance use in adolescents
A. Self-report
CRAFFT
Screening to Brief Intervention (S2BI)
Brief Screener for Alcohol, Tobacco, and Other Drugs (BSTAD)
B. Clinician-administered interviews with substance use screens
Global Appraisal of Individual Needs (GAIN)
Teen Addiction Severity Index (T-ASI)
Kiddie Schedule for Affective Disorders and Schizophrenia (K-SADS)
Other psychiatric conditions in adolescents
Global Appraisal of Individual Needs (GAIN)
Child Mania Rating Scale-Parent Version (CMRS-P)
Quick Inventory of Depressive Symptomatology (QIDS-A17-C)
Vanderbilt ADHD Diagnostic Teacher Rating Scale
Swanson, Nolan, and Pelham-IV Questionnaire (SNAP-IV)
Screen for Child Anxiety Related Disorders (SCARED)

critical to note that although symptoms may dissipate after cessation of substance use, clinicians should not wait for abstinence prior to making a diagnosis of a co-occurring mental health disorder and/or initiating a comprehensive treatment regimen.

A variety of screening tools can be used to guide the assessment of potential psychiatric and SUD diagnoses in adolescents. Some of these tools require clinical administration (not self-report) and lengthier time commitments (Table 5.1). Many of these screens can be found through the websites of:

- The American Academy of Child and Adolescent Psychiatry (AACAP): http://www.aacap.org/AACAP/Member_Resources/AACAP_Toolbox_for_Clinical_Practice_and_Outcomes/Forms.aspx.
- The National Institute on Drug Abuse (NIDA) Chart of Evidence-Based Screening Tools for Adults and Adolescents: https://www.drugabuse.gov/nidamed-medical-health-professionals/tool-resources-your-practice/screening-assessment-drug-testing-resources/chart-evidence-based-screening-tools-adults.

When making a diagnosis, consideration should be given to the potential influence of intoxication/withdrawal states on presenting symptoms. For example, during withdrawal periods substances such as marijuana can cause persisting irritability and sleep disturbances (REM rebound with vivid nightmares) that can mimic an underlying depressive syndrome. Adolescents with active substance use may

outwardly display more secretive behaviors that can be mistaken for social isolation and/or avoidance. Any heavy substance use can impair a student's ability to focus and concentrate on school work. In addition, prescription stimulant use, even in dosages that are commonly used to treat ADHD, may exacerbate or directly cause symptoms of anxiety and panic. Finally, sleep patterns may also become significantly disrupted due to influences by substance use and associated behaviors.

Treatment of Co-occurring Psychiatric Disorders

Behavioral Treatments

Treating co-occurring psychiatric disorders is imperative, as they are associated with an earlier age and heavier use, higher rates of relapse, and more severe withdrawal symptoms [19]. Research also suggests that adolescents exhibiting co-occurring externalizing disorders have an increased risk for relapse shortly after treatment cessation when compared to adolescents with internalizing disorders [20]. Unfortunately, there are only a limited number of Substance Abuse and Mental Health Services Administration (SAMHSA) supported interventions that are evidence-based for adolescents with dual diagnoses (Table 5.2). Only five of these programs have supporting evidence for the treatment of co-occurring internalizing disorders (i.e., depression and anxiety): the Adolescent Community Reinforcement Approach, Family Behavior Therapy, Phoenix House Academy, The Seven Challenges, and Seeking Safety [21]. Some of these programs are described in further detail in Chaps. 4 and 6.

Table 5.2 SAMHSA's 2017 National Registry of Evidence-based Programs and Practices (NREPP)

Name of program
Adolescent Community Reinforcement Approach[a]
Chestnut Health Systems-Bloomington Adolescent Outpatient and Intensive Outpatient Treatment
Family Behavior Therapy[a]
Family Support Network
Multidimensional Family Therapy
Multi-Systemic Therapy
Parenting with Love and Limits
Phoenix House Academy[a]
The Seven Challenges[a]
Seeking Safety[a]

[a]This symbol denotes the five programs that have supporting evidence for the treatment of co-occurring internalizing disorders [21]; please note that programs listed here are from an earlier compilation listed in NREPP in 2017 that exclusively included interventions with a strong evidence base

Treatments targeting co-occurring externalizing disorders in adolescents with an SUD include the Multi-Systemic Therapy, Multidimensional Family Therapy, the Adolescent Community Reinforcement Approach, Cognitive Behavioral Therapy (CBT) combined with Motivational Interviewing (adding contingency management can improve effectiveness), and pharmacotherapy when targeting ADHD with co-occurring substance use [19]. Treatments targeting co-occurring internalizing disorders in adolescents with an SUD include CBT combined with motivational interviewing or mindfulness; Coping with Depression; family therapies such as the Brief Strategic Family Therapy, Family-Focused Therapy for adolescents, and Behavioral Family Systems Therapy; Multi-Systemic Therapy; and the peer-helping component of the 12-step programs. However, evidence for these treatments is often mixed and at times still preliminary in nature [19]. These treatments can be administered by a variety of mental health and general healthcare professionals in both clinical and nonclinical settings. A common theme in these programs is the enhancement of motivation for substance reduction through strengthening the client's internal and external motivators. For example, motivational interviewing highlights the adolescent's own reasons and desires for change, while contingency management establishes an external reward system to enhance motivation for goal achievement (typically substance use reduction).

Pharmacological Treatments

In terms of medication, once an additional mental health condition is identified, a common question is whether or not to treat psychiatric symptoms immediately or to wait and see if they improve with substance use reduction or abstinence. There have been a limited number of studies examining the risks/benefits of treating symptoms immediately or waiting until substance use declines. Riggs et al. found that depressive symptoms demonstrated a good response to CBT alone in adolescents with co-occurring substance use [22]. However, the study authors recommend considering the use of medication such as fluoxetine if symptoms do not improve/remit past early treatment even without abstinence. In this study, adolescents who continued to use a wide range of substances responded to medication intervention at similar rates to those who were abstinent. There are almost no data to elucidate the influence of specific substances on psychiatric medications in adolescents. There are limited data examining this relationship in adults, with active substance use during treatment demonstrating a less favorable response to lithium (mood stabilizer) in BD [23] and antidepressants in depression [24].

As noted above, there is a substantial overlap between ADHD and substance use. If possible, treatment should first be provided with a non-stimulant medication such as atomoxetine or an α-agonist. If symptoms do not respond, a stimulant should be considered. While parents and clinicians may have concerns about the potential risk of stimulant medication in their children, there is significant evidence suggesting that children who receive ADHD treatment earlier, and use stimulant medications for a longer period of time, have lower rates of substance use during adolescence [25].

If opting to use stimulant medication, clinicians should target longer-acting over shorter-acting stimulants, as well as formulations with lower misuse potential such as lisdexamfetamine (trade name Vyvanse). Lisdexamfetamine requires an enzymatic reaction in the gastrointestinal system in order to be activated, decreasing the likelihood an adolescent will use it via other routes of administration (e.g., inhalation or injection). In these situations, parents are often coached to directly supervise administration of controlled substances while limiting access to medications by ensuring safe storage (e.g., locked medication cabinet). In cases where there are concerns around potential diversion in the household, schools are often equipped for administration of the medication during the school week. Clinicians should also be aware that medication treatment alone in individuals with ADHD and current active co-occurring substance use is not always effective, suggesting the need for a combination of structured psychotherapies in addition to any pharmacotherapy [26].

There are limited data for the treatment of co-occurring BD in adolescents with SUDs. The use of lithium in adolescents with BD has shown some benefit in decreasing substance use and stabilizing mood symptoms [27], although active substance use has also demonstrated a lower response to lithium among patients with BD in other studies [23]. In a small case series, individuals who received valproic acid experienced a decrease in both substance use and affective symptoms [28]. The presence of an alcohol use disorder in adolescents with BD may contribute to poorer medication adherence and higher rates of BD syndrome recurrence [29]. There is no consensus on how long to continue treatment for co-occurring disorders. For example, evidence suggests a benefit of a 6–12 month continuation phase after acute treatment completion for depressive disorders in order to decrease the likelihood of potential relapse of depressive symptoms [30].

Conclusions

Unfortunately, co-occurring mental health disorders in adolescents with problematic substance use are more often the rule rather than the exception. Active substance use can negatively impact mental health disorder identification and symptomatology, treatment adherence, and overall treatment success. The timely and accurate diagnosis of a co-occurring mental health disorder in adolescents presenting with substance use in clinic is crucial but often difficult to achieve. Although no rapid evidence-based screening tools exist for the combined assessment of substance use and co-occurring disorders, lengthier assessment screens or a combination of tools are available to aid in the evaluation process. There are currently no gold standard treatments for treating co-occurring mental health and SUDs in adolescents. However, a combination of both behavioral and pharmacological treatments has demonstrated evidence in symptom reduction.

Take-Home Points

- There is a high co-occurrence of mental health disorders and substance use in adolescents.
- There are currently no gold standard screening tools or treatment options for co-occurring mental health and SUDs in adolescents.
- An emphasis should be placed on the concurrent treatment of any mental health disorders in adolescents with problematic substance use.

References

1. Armstrong TD, Costello EJ. Community studies on adolescent substance use, abuse, or dependence and psychiatric comorbidity. J Consult Clin Psychol. 2002;70(6):1224–39.
2. Conway KP, Swendsen J, Husky MM, He J-P, Merikangas KR. Association of Lifetime Mental Disorders and Subsequent Alcohol and illicit drug use: results from the National Comorbidity Survey-Adolescent Supplement. J Am Acad Child Adolesc Psychiatry. 2016;55(4):280–8.
3. Deas D, Brown ES. Adolescent substance abuse and psychiatric comorbidities. J Clin Psychiatry. 2006;67(7):e02.
4. Center for Behavioral Health Statistics and Quality. Behavioral health trends in the United States: Results from the 2014 National Survey on Drug Use and Health (HHS Publication No. SMA 15-4927, NSDUH Series H-50). 2015. Retrieved from http://www.samhsa.gov/data/.
5. American Psychiatric Association. American Psychiatric Association: diagnostic and statistical manual of mental disorders. 5th ed. Arlington: American Psychiatric Association; 2013.
6. Hussong AM, Ennett ST, Cox MJ, Haroon M. A systematic review of the unique prospective association of negative affect symptoms and adolescent substance use controlling for externalizing symptoms. Psychol Addict Behav. 2017;31(2):137–47.
7. Wolitzky-Taylor K, Bobova L, Zinbarg RE, Mineka S, Craske MG. Longitudinal investigation of the impact of anxiety and mood disorders in adolescence on subsequent substance use disorder onset and vice versa. Addict Behav. 2012;37(8):982–5.
8. Welsh JW, Knight JR, Hou SS-Y, Malowney M, Schram P, Sherritt L, et al. Association between substance use diagnoses and psychiatric disorders in an adolescent and young adult clinic-based population. J Adolesc Health. 2017;60(6):648–52.
9. Stephens JR, Heffner JL, Adler CM, Blom TJ, Anthenelli RM, Fleck DE, et al. Risk and protective factors associated with substance use disorders in adolescents with first-episode mania. J Am Acad Child Adolesc Psychiatry. 2014;53(7):771–9.
10. Lewinsohn PM, Klein DN, Seeley JR. Bipolar disorders in a community sample of older adolescents: prevalence, phenomenology, comorbidity, and course. J Am Acad Child Adolesc Psychiatry. 1995;34(4):454–63.
11. Volkow ND, Baler RD, Compton WM, Weiss SRB. Adverse health effects of marijuana use. N Engl J Med. 2014;370(23):2219–27.
12. Carney R, Yung AR, Amminger GP, Bradshaw T, Glozier N, Hermens DF, et al. Substance use in youth at risk for psychosis. Schizophr Res. 2017;181:23–9.
13. Miettunen J, Murray GK, Jones PB, Mäki P, Ebeling H, Taanila A, et al. Longitudinal associations between childhood and adulthood externalizing and internalizing psychopathology and adolescent substance use. Psychol Med. 2014;44(8):1727–38.

14. Colder CR, Scalco M, Trucco EM, Read JP, Lengua LJ, Wieczorek WF, et al. Prospective associations of internalizing and externalizing problems and their co-occurrence with early adolescent substance use. J Abnorm Child Psychol. 2013;41(4):667–77.
15. Dennis M, Godley SH, Diamond G, Tims FM, Babor T, Donaldson J, et al. The Cannabis Youth Treatment (CYT) study: main findings from two randomized trials. J Subst Abus Treat. 2004;27(3):197–213.
16. Lee SS, Humphreys KL, Flory K, Liu R, Glass K. Prospective association of childhood attention-deficit/hyperactivity disorder (ADHD) and substance use and abuse/dependence: a meta-analytic review. Clin Psychol Rev. 2011;31(3):328–41.
17. Yoshimasu K, Barbaresi WJ, Colligan RC, Voigt RG, Killian JM, Weaver AL, et al. Childhood ADHD is strongly associated with a broad range of psychiatric disorders during adolescence: a population-based birth cohort study. J Child Psychol Psychiatry. 2012;53(10):1036–43.
18. Priester MA, Browne T, Iachini A, Clone S, DeHart D, Seay KD. Treatment access barriers and disparities among individuals with co-occurring mental health and substance use disorders: an integrative literature review. J Subst Abus Treat. 2016;61:47–59.
19. Brewer S, Godley MD, Hulvershorn LA. Treating mental health and substance use disorders in adolescents: what is on the menu? Curr Psychiatry Rep. 2017;19(1):5.
20. Tomlinson KL, Brown SA, Abrantes A. Psychiatric comorbidity and substance use treatment outcomes of adolescents. Psychol Addict Behav. 2004;18(2):160–9.
21. Hulvershorn LA, Quinn PD, Scott EL. Treatment of adolescent substance use disorders and co-occurring internalizing disorders: a critical review and proposed model. Curr Drug Abuse Rev. 2015;8(1):41–9.
22. Riggs PD, Mikulich-Gilbertson SK, Davies RD, Lohman M, Klein C, Stover SK. A randomized controlled trial of fluoxetine and cognitive behavioral therapy in adolescents with major depression, behavior problems, and substance use disorders. Arch Pediatr Adolesc Med. 2007;161(11):1026–34.
23. Emslie GJ, Mayes TL, Laptook RS, Batt M. Predictors of response to treatment in children and adolescents with mood disorders. Psychiatr Clin North Am. 2003;26(2):435–56.
24. Davis LL, Wisniewski SR, Howland RH, Trivedi MH, Husain MM, Fava M, et al. Does comorbid substance use disorder impair recovery from major depression with SSRI treatment? An analysis of the STAR*D level one treatment outcomes. Drug Alcohol Depend. 2010;107(2):161–70.
25. McCabe SE, Dickinson K, West BT, Wilens TE. Age of onset, duration, and type of medication therapy for Attention-Deficit/Hyperactivity Disorder (ADHD) and substance use during adolescence: a Multi-Cohort National Study. J Am Acad Child Adolesc Psychiatry. 2016;55(6):479–86.
26. Zulauf CA, Sprich SE, Safren SA, Wilens TE. The complicated relationship between attention deficit/hyperactivity disorder and substance use disorders. Curr Psychiatry Rep. 2014;16(3):436.
27. Geller B, Cooper TB, Sun K, Zimerman B, Frazier J, Williams M, et al. Double-blind and placebo-controlled study of lithium for adolescent bipolar disorders with secondary substance dependency. J Am Acad Child Adolesc Psychiatry. 1998;37(2):171–8.
28. Donovan SJ, Susser ES, Nunes EV, Stewart JW, Quitkin FM, Klein DF. Divalproex treatment of disruptive adolescents: a report of 10 cases. J Clin Psychiatry. 1997;58(1):12–5.
29. DelBello MP, Hanseman D, Adler CM, Fleck DE, Strakowski SM. Twelve-month outcome of adolescents with bipolar disorder following first hospitalization for a manic or mixed episode. Am J Psychiatry. 2007;164(4):582–90.
30. Kaminer Y, Connor DF, Curry JF. Comorbid adolescent substance use and major depressive disorders. Psychiatry (Edgmont). 2007;4(12):32–43.

Recommended Reading

Brewer S, Godley MD, Hulvershorn LA. Treating mental health and substance use disorders in adolescents: what is on the menu? Curr Psychiatry Rep. 2017;19(1):5.

Hussong AM, Ennett ST, Cox MJ, Haroon M. A systematic review of the unique prospective association of negative affect symptoms and adolescent substance use controlling for externalizing symptoms. Psychol Addict Behav. 2017;31(2):137–47.

Priester MA, Browne T, Iachini A, Clone S, DeHart D, Seay KD. Treatment access barriers and disparities among individuals with co-occurring mental health and substance use disorders: an integrative literature review. J Subst Abus Treat. 2016;61:47–59.

Welsh JW, Knight JR, Hou SS-Y, Malowney M, Schram P, Sherritt L, et al. Association between substance use diagnoses and psychiatric disorders in an adolescent and young adult clinic-based population. J Adolesc Health. 2017;60(6):648–52.

Yoshimasu K, Barbaresi WJ, Colligan RC, Voigt RG, Killian JM, Weaver AL, et al. Childhood ADHD is strongly associated with a broad range of psychiatric disorders during adolescence: a population-based birth cohort study. J Child Psychol Psychiatry. 2012;53(10):1036–43.

Chapter 6
Behavioral Interventions for Substance Use and Relapse Prevention

Mark D. Godley and Lora L. Passetti

Behavioral Interventions for Substance Use and Relapse Prevention

The key aims of this chapter are to (1) briefly describe various behavioral interventions for substance use and their research support, (2) discuss the need for adolescents to increase pleasure or fun in recovery and build recovery capital in order to prevent relapse, and (3) describe the Adolescent Community Reinforcement as one approach with a strong evidence base that works with adolescents to increase their sources of recovery capital.

Over the last two decades, a host of behavioral interventions have emerged to help adolescents with substance use disorders. Many of these treatments are supported by evidence from one or more clinical trials of effectiveness in practice settings, and some are not. Specific treatments can, in general, be sorted into the following categories: family therapy, motivational interviewing (MI), cognitive behavior therapy (CBT), contingency management (CM), or 12-step programs.

Behavioral Interventions for Substance Use

Family Therapy

Addiction often affects the family system. For this reason, family therapy approaches involve family members along with the identified patient. Since the family is viewed as a system of different parts, the underlying assumption is that a change in one part

M. D. Godley (✉) · L. L. Passetti
Lighthouse Institute, Chestnut Health Systems, Normal, IL, USA
e-mail: mgodley@chestnut.org

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of the system will create changes in the other parts. These treatments may be combined with other approaches, such as CBT techniques. Family therapy sessions may include discussions of family concerns, how people are feeling, what problems need to be addressed, and what changes have been happening. Sessions also focus on the development of coping and communication skills. Published reviews suggest that family therapy models are the most effective for substance use reduction [1, 2], and it is noteworthy that the American Academy of Child and Adolescent Psychiatry recommends family therapies as best practice [3]. Examples of family approaches supported by one or more randomized controlled trials include Brief Strategic Family Therapy (BSFT), Functional Family Therapy (FFT), Family Behavior Therapy (FBT), and Multi-systemic Therapy (MST). The latter two combine training of parents in contingency management techniques as a catalyst for behavior change.

Motivational Interviewing (MI) and Cognitive Behavior Therapy (CBT)

MI approaches are typically brief and limited to interventions in screening situations, such as primary care offices, emergency departments, or college health centers. A single session is often used to help youth resolve ambivalent feelings about change and commit to participation in a treatment program. Five major principles of MI include expressing empathy through reflective listening, developing discrepancy between a patient's behavior and goals, dealing with resistance by avoiding confrontation, supporting self-efficacy to change, and developing autonomy.

CBT refers to a variety of interventions that focus on the present and goal-directed behavior change. The clinician is seen as a collaborator with the patient and uses strategies based in classical conditioning, operant conditioning, and social learning perspectives while taking contextual factors in to account. MI techniques have been combined with CBT to form brief outpatient treatment interventions in specialty addiction treatment programs. These are often known as Motivational Enhancement Therapy and CBT. CBT treatment manuals, like those published by the Substance Abuse and Mental Health Services Administration (SAMHSA), tend to be tightly scripted, sequential sessions that provide little flexibility in delivering the intervention. When included in randomized controlled trials, the results for MI have generally been comparable to longer, more involved treatment. CBT has been studied in both individual and group formats in outpatient settings, and there is evidence from randomized controlled trials that both formats are comparable in effectiveness to some family therapies and more effective than treatment as usual.

Contingency Management (CM)

An operant behavioral approach, CM involves providing patients with tangible rewards to reinforce positive behaviors (e.g., abstinence). CM has been used to treat adult substance use disorders and has been widely researched with numerous

randomized controlled trials. While less research has been conducted with adolescents, there have been several trials pointing to the effectiveness of CM in helping youth become drug free. One way in which this can be achieved is by providing incentive programs (e.g., vouchers or "fishbowl") where youth earn prizes that escalate in value for consecutive weeks of negative urine test findings. A major concern is that if CM prizes end, abstinence may end as well; however, results of studies examining this concern are mixed, with some research showing maintenance of effect over posttreatment follow-up and others showing drug use rebounding. Despite research support, CM has not been as widely disseminated in practice as many of the other models discussed, and this may be due to concerns that providers or parents object to the idea of "paying youth to be abstinent." On the other hand, CM increases positive feedback for desirable behaviors which may reduce feelings of ambivalence about change and eventually outweigh the reward perceived with substance use.

12-Step Programs

Since the earliest days of the modern era of treatment, most adult treatment programs have been grounded in the 12 steps and may even require attendance at Alcoholics Anonymous (AA), Narcotics Anonymous (NA), or other mutual aid group meetings. Many adolescent treatment programs are adaptations of these adult-oriented 12-step models. While there is some evidence that 12-step-based treatment helps adolescents reduce substance use, no randomized controlled trials have been conducted. One randomized pilot study of an integrated Twelve-Step Facilitation (iTSF) treatment with adolescents found that compared with motivational enhancement/cognitive behavior therapy, iTSF did not demonstrate greater benefits in terms of abstinence but did in terms of 12-step meeting attendance and in reducing substance-related consequences [4]. Additionally, there are only a fraction of adolescent-focused community mutual aid meetings available relative to those for adults, and research has led to recommendations that adult meetings should be carefully vetted before sending adolescents to them. Despite these limitations, adolescents who engage in a supportive 12-step community may discover a pathway to recovery that is available at no cost throughout their lives.

Relapse Prevention

Even though behavioral interventions can reduce substance use in adolescents, the risk of relapse remains a challenge once treatment ends. Keeping adolescents engaged in recovery gains heightened importance since late adolescence and early adulthood are the peak years for developing problems related to substance use disorders. Adolescent brains have not finished developing, leaving youth prone to poor impulse control and decision-making. Recovery support is essential to help

Table 6.1 Types of recovery capital

Personal	Physical health, financial health, educational/vocational skills, problem-solving ability, self-efficacy to manage high-risk situations, and interpersonal skills
Family/ social	Relationships with partners, family, and others supportive of recovery
Community	Community efforts to reduce stigma, the availability of addiction treatment and mutual aid resources, the accessibility of sustained recovery support, and the availability of culturally appropriate recovery support

Data source: [6]

adolescents make healthy choices and mature physically and emotionally, whether or not they are beginning a lifelong cycle of substance use, treatment, and relapse. Recent research has emphasized the need to find ways to increase pleasure or fun in order to maintain long-term recovery. Similarly, other researchers have recommended that providers acknowledge the importance of participation in meaningful activity [5] in order to increase "recovery capital" [6].

Recovery capital refers to the internal and external resources that individuals can access to initiate and sustain recovery and consists of multiple facets (Table 6.1) [6–8]. While little research into adolescents and recovery capital has been conducted at this time, individuals with more recovery capital are thought to have access to more resources that can help address many common personal- and environmental-related barriers to recovery, including low motivation to change, emotional difficulties, peer pressure to use, high-risk relapse situations, and interpersonal conflict [6]. Correlational research generally supports that higher levels of recovery capital predict sustained recovery, higher quality of life, and lower stress after 1 year [9]. Additional research has found that individuals who engage in meaningful activities have significantly higher quality of life than those who do not. Individuals in treatment who report abstinence and engagement in meaningful activity report the highest quality of life. Participation in meaningful activities can create opportunities for developing personal recovery capital such as self-esteem and self-efficacy, provide ways to extend networks of pro-recovery people, and facilitate access to community resources [10].

Adolescent Community Reinforcement Approach (A-CRA)

A-CRA is one behavioral treatment for adolescent substance use disorders that has earned strong research support and is based on building new, pleasurable prosocial behaviors to increase recovery capital [11]. Naming conventions for most treatments are carefully chosen to describe or imply a philosophy or a set of techniques. Unfortunately, the intention behind the name "Adolescent Community Reinforcement Approach" (A-CRA) is not as accessible to clinicians as the developers might have hoped. The name implies neither family therapy nor motivational CBT, but it is both.

Theoretical Underpinnings of A-CRA

According to the CRA model, successful treatment begins with first listening to each patient in order to learn as much as possible about what their (non-using) reinforcers and potential sources of recovery capital are. The more therapists learn from listening, the more effective they can be in helping patients access these reinforcers. For some patients, it may be resolving their legal situation. For others, it may be accessing dormant personal recovery capital by returning to a competitive sport, shaping study skills to pass geometry, or sharing their artwork with others. Improving family/social recovery capital by increasing positive communication with family and other important individuals and problem-solving through guided practice and feedback is often a major reinforcer for patients and their significant others.

The therapist next obtains a thorough understanding of the pleasurable as well as the negative consequences of substance use. This forms the future basis for illustrating the relationship between positive consequences of substance use and finding substitute positive reinforcers in new activities. After, the therapist has the patient rate their personal satisfaction with major areas of their community life (e.g., school, work, romantic relationships, family and peer relationships, legal, emotional, economic, and other areas). This self-assessment allows the therapist to support the patient in developing short-term, achievable goals and recovery capital in life/health areas that would increase positive reinforcement derived from a variety of interpersonal, social, vocational, educational, and family relationships. To the extent the patient is successful in improving or developing multiple sources of such reinforcing activities within the community, a return to substance use would likely invoke negative consequences from use (e.g., loss of job, disruption of improved family relationships).

Procedures

Functional Analysis/Increasing Prosocial Activity The functional analysis of prosocial behavior and increasing prosocial activity procedures are complementary and address the key mechanism of change underlying A-CRA. By increasing time spent participating in prosocial activities, youth have fewer opportunities to use substances and a greater chance of increasing recovery capital. More recovery capital can be gained through engaging in meaningful activities; spending time with pro-recovery family, peers, and other adults; and potentially interacting with other recovery resources in the community. The enjoyment received from engaging in these prosocial activities then serves as positive motivation for change and incentives for maintaining abstinence. Youth are asked to describe activities that they enjoy and do not usually involve using alcohol or other drugs. For patients so enmeshed in substance use that they cannot recall prosocial activities they once enjoyed or imagine new activities, the A-CRA manual includes a survey of more

than 300 youth-oriented prosocial activities that patients can review and rate in terms of personal preference. They are then asked which of these activities can be realistically increased in frequency. Triggers (antecedent behavior) and consequences (positive or negative) of this behavior are then discussed, and a plan is developed for when, where, and how the activity will be completed before the next session, but not before the clinician asks the patient to think through potential barriers to doing the activity and problem solve for overcoming such barriers. Clinicians praise any progress toward goal completion with the aim of keeping the youth's motivation for change high. At times, clinicians will work with youth to identify a prosocial activity to increase or try out, set a goal to complete the activity, discuss obstacles to goal completion, and problem solve ways to overcome those obstacles. Typically, these procedures are completed toward the beginning of treatment and revisited as necessary during subsequent sessions as the youth's needs change.

Systematic Encouragement Both adolescent and adult patients are often reluctant to engage in new activities, services, or relationships. Systematic encouragement is a procedure that clinicians use to help patients take the initial steps toward a new or avoided activity. Youth may be reluctant to engage in an activity or avoid an activity because of prior negative experiences, lack of information or knowledge about what to do or who to contact, or not knowing what to say. They may be overwhelmed by the task or need assistance identifying the steps involved to get started. The rationale is that if youth have help in beginning a task during a session, they will be more likely to finish the remaining steps on their own. Clinicians collaborate with the youth to break a task down into small, achievable steps, practice completing a step, and actually complete the first step during the session. Homework may be related to following through with the rest of the goal along with a discussion of obstacles to completion and possible solutions. Systematic encouragement can be used during any session and is often used in conjunction with increasing prosocial activity. Clinicians look for opportunities to use systematic encouragement at any point during treatment to increase the likelihood that patients will complete tasks.

Relapse Prevention The relapse prevention procedure uses relapse as a learning opportunity. Using a version of the functional analysis of substance use procedure, the patient is asked to identify the internal and external triggers that occurred right before the relapse. One technique in the relapse prevention procedure is to help the patient determine the behavioral chain of events leading to relapse and plan strategies to interrupt that chain in the future by developing opt out points on the chain with alternative activities to compete with the familiar steps along the behavior chain that otherwise lead to relapse. Other techniques involve an early warning system that identifies high-risk situations and a monitor which can intervene when the patient shows early signs of relapse, thus increasing social recovery capital by providing more opportunities for support from others. This procedure is generally completed as needed, typically after a relapse is reported.

Communication Skills Communication skills is a procedure that teaches youth to communicate with other people in their lives a positive manner. Enhancing communication skills can increase the quality of relationships with parents, peers, and other adults and provide a way for youth to increase social recovery capital, widen pro-recovery social networks that can be important to maintaining treatment gains, and deal with individuals who may influence recovery negatively. Clinicians talk with youth about why positive communication skills are important, the three parts of positive communication (making an understanding statement, taking partial responsibility, offering to help), and the importance of practice between sessions. Examples of positive communication are reviewed, and guided practice with feedback through role-plays is conducted in session until the patient is successful in making an understanding acknowledgment of a problem, taking partial responsibility, and offering help to solve the problem. Using a reverse role-play (where the patient plays the role of the significant other and the therapist models the three steps of the communication skill) allows the youth to demonstrate to the clinician the behavior of the other person while also observing how the clinician can defuse anger and improve the quality of the interaction. The communication skills procedure can be used frequently since practice is often needed.

Problem-Solving The problem-solving procedure teaches youth how to handle problems that emerge in life as well as those related to reliance on alcohol and other drugs to cope with difficulties. Learning positive ways to handle issues can increase self-efficacy and self-esteem by breaking problems down into small steps. It can also show youth potential ways to navigate emotional issues, high-risk for relapse situations, interpersonal conflict, and ways to access and engage in meaningful activities and community resources. Youth learn seven steps in the problem-solving procedure, including defining the problem narrowly, brainstorming possible solutions, eliminating undesired suggestions, selecting one potential solution that can be done in the next week, generating possible obstacles to that solution, addressing each obstacle, and developing a homework task related to the chosen solution.

Family Sessions Family sessions (caregiver-adolescent relationship skills) are designed to bring the adolescent and caregiver together with the goal of improving their relationship. By learning how to say positive things to others and how to hear others say positive things, individuals can increase recovery capital by developing positive interactions with others that may reinforce them in their recovery efforts. Family sessions begin with an exercise where both the adolescent and caregiver take turns saying three positive things about one another. A Relationship Happiness Scale is then completed to help identify what in the relationship is going well and what areas are in need of communication and problem-solving skill practice. Sessions end with a daily reminder to be nice calendar (a 7-day calendar that prompts each family member to express appreciation, compliment, give a pleasant surprise, express affection, initiate pleasant conversation, and offer to help), as well as an agreement to practice positive interactions regardless of what is happening in their lives. Finally, a specific homework task that would involve the use of commu-

nication or problem-solving skills may also be negotiated prior to completing a family session. A minimum of two family sessions are recommended within the first 13 weeks of outpatient treatment, but additional sessions are encouraged as needed. In a related model, the Community Reinforcement Approach and Family Training (CRAFT) approach, designed to help concerned significant others engage reluctant or resistant family members in substance use treatment, has proven effective in several controlled trials.

Conclusion

While effective treatments for adolescent substance use disorders exist, relapse once interventions conclude remains a concern. One way to help adolescents maintain intervention gains is for treatment programs to work with them to increase their sources of recovery capital, in part by increasing participation in fun, meaningful activities, including positive communication skills. Notable is the development and testing of family-based, motivational, cognitive behavior, and contingency management therapies. Additionally, 12-step oriented programs, accompanied by attendance at mutual aid meetings, have been studied. A-CRA includes both behavioral and cognitive behavioral therapy procedures. Various levels of research evidence support these interventions, with family therapy, CBT, and A-CRA having the strongest empirical verification.

Future research is recommended to better assess recovery capital domains and study the relationship of improved recovery capital to preventing relapse and improving long-term clinical outcomes.

Take-Home Points

The following points summarize the lessons learned about behavioral interventions for substance use and relapse:

- Behavioral interventions are well-established and can be reviewed on the National Registry of Evidence-Based Programs and Practices (samhsa.gov/nrepp).
- Despite treatment effectiveness, relapse remains a challenge after treatment ends.
- Recent research has emphasized the need to find ways to increase pleasure or fun in recovery, simultaneously building recovery capital to sustain long-term recovery.
- A-CRA is an approach based on building new, pleasurable prosocial behaviors to increase recovery capital.

- Future research is needed to better assess and monitor recovery capital across multiple domains to help adolescent transition into young adults with a healthier future.

References

1. Tanner-Smith EE, Wilson SJ, Lipsey MW. The comparative effectiveness of outpatient treatment for adolescent substance abuse: a meta-analysis. J Subst Abus Treat. 2013;44(2):145–58.
2. Waldron HB, Turner CW. Evidence-based psychosocial treatments for adolescent substance abuse. J Clin Child Adolesc Psychol. 2008;37(1):238–61.
3. Bukstein OG, Bernet W, Arnold V, Beitchman J, Shaw J, Benson RS, Kinlan J, McClellan J, Stock S, Ptakowski KK, Work Group on Quality Issues. Practice parameter for the assessment and treatment of children and adolescents with substance use disorders. J Am Acad Child Adolesc Psychiatry. 2005;44(6):609–21.
4. Kelly JF, Kaminer Y, Kahler CW, Hoeppner B, Yeterian J, Cristello JV, Timko C. A pilot randomized clinical trial testing integrated 12-step facilitation (iTSF) treatment for adolescent substance use disorder. Addiction. 2017;112(12):2155–66.
5. Best D, Honor S, Karpusheff J, Loudon L, Hall R, Groshkova T, White W. Well-being and recovery functioning among substance users engaged in post-treatment recovery support groups. Alcohol Treat Q. 2012;30:397–406.
6. White W, Cloud W. Recovery capital: a primer for addictions professionals. Counselor. 2008;9(5):22–7.
7. Cloud W, Granfield R. Conceptualizing recovery capital: expansion of a theoretical construct. Subst Use Misuse. 2008;43(12–13):1971–86.
8. Granfield R, Cloud W. Coming clean: overcoming addiction without treatment. New York: New York University Press; 1999.
9. Laudet AB, White WL. Recovery capital as prospective predictor of sustained recovery, life satisfaction, and stress among former poly-substance users. Subst Use Misuse. 2008;43(1):27–54.
10. Best D, Savic M, Beckwith M, Honor S, Karpusheff J, Lubman DI. The role of abstinence and activity in the quality of life of drug users engaged in treatment. J Subst Abus Treat. 2013;45:273–9.
11. Godley SH, Smith JE, Meyers RJ, Godley MD. The adolescent community reinforcement approach: a clinical guide for treating substance use disorders. Normal: Chestnut Health Systems; 2016.

Chapter 7
Medications for Substance Use and Relapse Prevention

Christopher J. Hammond and Pravesh Sharma

Introduction

Adolescent- and young adult-onset substance use disorders (SUDs) are associated with elevated morbidity and mortality [1, 2]. Early identification and successful treatment of youth with SUDs have the potential to alter developmental trajectories and improve long-term health outcomes. Evidence-based psychosocial interventions represent the primary treatment modality recommended for youth with SUD [1]. A number of evidence-based psychosocial interventions have demonstrated short-term efficacy and effectiveness for treatment of SUDs in youth. These interventions generally result in a modest reduction in substance use on average, but with significant individual differences in treatment response across adolescents [2]. Many youth that initiate substance use treatment, even when evidence-based interventions are applied, drop out prior to treatment completion, do not substantially reduce their substance use, or relapse within 6 months of treatment engagement. Thus, a significant minority of youth with an SUD who present for treatment fail to improve on traditional study outcomes with current "gold-standard" treatments.

C. J. Hammond (✉)
Division of Child and Adolescent Psychiatry, Johns Hopkins University School of Medicine, Baltimore, MD, USA

Behavioral Pharmacology Research Unit, Johns Hopkins University School of Medicine, Baltimore, MD, USA

Department of Psychiatry and Behavioral Sciences, Johns Hopkins University School of Medicine, Baltimore, MD, USA
e-mail: chammo20@jhmi.edu

P. Sharma
Division of Child and Adolescent Psychiatry, Johns Hopkins University School of Medicine, Baltimore, MD, USA

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Recent clinical research priorities have focused on developing novel treatment strategies that enhance treatment response and improve functional outcomes in both adolescents and adults [1, 2]. One treatment strategy that has demonstrated effectiveness in adult SUDs has been to combine evidence-based psychosocial interventions with adjunctive pharmacotherapy. A growing body of evidence suggests that medications for addiction treatment (MAT, formerly known as medication-assisted treatment) improve treatment outcomes in adults with opioid, alcohol, and tobacco use disorders [2]. In contrast to the ample research in adults, few studies have been completed in youth. Here, we review the scientific literature on clinical studies of pharmacotherapies and MAT for SUDs in adolescents and young adults.

Significance of Developmental Differences in SUD Interventions for Youth

Developmental differences in biological, mental, and social processes exist between adults and adolescents and carry implications for psychosocial and pharmacologic SUD interventions [1–3]. During adolescence, the neural circuitry involved in cognitive control, motivation, and emotion processing undergoes staggered maturational shifts leading to a developmentally "sensitive period" of imbalanced circuit function reflected in a relatively "weak" top-down cognitive regulation system and a relatively "strong" bottom-up emotion reactivity and reinforcement system [3]. (These development considerations are discussed in greater depth in Chap. 2: "Developmental Perspectives and Risk Factors for Substance Use.") Age-related differences in hepatic function, metabolic enzyme activity, and neurotransmitter system function also exist and result in adolescent versus adult differences in pharmacokinetics and pharmacodynamics for commonly misused substances, as well as psychotropic medications [2, 3].

Categories of Pharmacological Treatments

Medications used in the treatment of addictive disorders generally target one of the three SUD-related domains: (a) acute withdrawal symptoms and syndromes as part of detoxification, (b) reduction of cravings and substance use as part of maintenance SUD treatment, or lastly (c) overdose prevention as part of emergency management of high-risk individuals [4]. A number of medications have been approved by the US Food and Drug Administration (FDA) for the treatment of SUDs in adults. To date, buprenorphine is the only addiction medication that is FDA-approved for use in adolescents, and it is only approved for ages 16 and older [2]. While scientific evidence suggests that other addiction medications may improve outcomes (see Table 7.1), the use of these medications to treat SUD in adolescents is considered "off-label."

Table 7.1 Substance use disorder pharmacotherapies with limited safety, tolerability, and efficacy data in adolescents and young adults

Substance use disorder	Medication target			Level of evidence[a]
	Withdrawal/ detoxification	Maintenance or cessation aids	Overdose prevention	
Opioids	Buprenorphine, buprenorphine-naloxone	Buprenorphine, buprenorphine-naloxone		Grade B (level 2 evidence)
	Methadone	Methadone		Grade C (level 3 evidence)
	Clonidine			Grade B (level 2 evidence)
		Oral naltrexone or long-acting injectable extended-release naltrexone		Grade C (level 3 evidence)
			Intranasal or intramuscular naloxone	Grade C (level 3 evidence)
Alcohol	Benzodiazepines			Grade C (level 3 evidence)
		Oral naltrexone or long-acting injectable extended-release naltrexone		Grade C (level 3 evidence)
		Disulfiram		Grade C (level 3 evidence)
		Ondansetron		Grade C (level 3 evidence)
		Topiramate		Grade C (level 3 evidence)
Tobacco		Nicotine replacement therapy (patch, gum, lozenge, nasal spray, or inhaler)		Nicotine patch, grade B (level 2 evidence); nicotine gum and nasal spray, grade C (level 3)
		Bupropion-sustained release		Grade B (level 2 evidence)
		Varenicline		Grade B (level 2 evidence)
Cannabis		*N*-acetylcysteine		Grade B (level 2 evidence)
	Gabapentin	Gabapentin		Grade C (level 3 evidence)

Note: Buprenorphine (approved for ages > 16 years) is the only current FDA-approved medication for the treatment of substance use disorders in adolescents

[a]Levels of evidence presented are based on the US Preventative Services Task Force Strength of Recommendation Taxonomy approach to grading evidence in the medical literature. Levels of evidence include level 1, good-quality, patient-oriented evidence including systematic reviews, meta-analyses, and well-designed randomized controlled trials with consistent findings; level 2, limited-quality patient-oriented evidence including lower-quality/less consistent systematic reviews, meta-analyses, or clinical trials as well as cohort and case-control series; and level 3, other evidence in the form of consensus guidelines, disease-oriented evidence, and case series. These levels of evidence are used to determine a strength of recommendation grade, which includes A (good-quality, patient-oriented evidence), B (limited-quality, patient-oriented evidence), C (other evidence), and no recommendation

Medications to Treat Acute Withdrawal Syndromes

Many youth with SUDs report acute and/or protracted withdrawal symptoms upon cessation of alcohol and other drugs. While adolescents, on average, experience less intense withdrawal compared to adults, youth who do experience withdrawal symptoms are at elevated risk for poor treatment outcomes and persistent drug use. As such, providers should assess for withdrawal symptoms and syndromes in all youth presenting with SUDs. Based upon the drug the patient is withdrawing from, the severity of withdrawal symptoms, and/or other risk factors, providers may consider using a medication to treat the acute withdrawal syndrome.

Opioid Withdrawal Syndrome

Opioid withdrawal (OW) is the only acute withdrawal syndrome for which controlled studies have been completed in adolescent samples. This syndrome is often accompanied by anxiety, restlessness, bone or joint aches, lacrimation (tearing), rhinorrhea (runny nose), mydriasis (dilated pupils), yawning, tremor, abdominal cramping, diarrhea, tachycardia (elevated heart rate), and diaphoresis (sweating). The onset and duration of symptoms depend on the half-life of the opioid. For short-acting opioids such as heroin, symptoms often peak within 48–72 h and resolve within 7 days. However, some symptoms such as insomnia and irritability may persist beyond this time period.

Buprenorphine-naloxone, a mu-opioid receptor partial agonist, has been shown to effectively reduce OW symptoms across three controlled studies in adolescents [5, 6]. Please refer to Case 4 in Section IV for further details on buprenorphine and how it may be used in clinical practice. Clonidine, an alpha-2-agonist and non-opioid detoxification medication, has also been shown to be effective at reducing OW symptoms [5]. Marsch and colleagues compared the efficacy of clonidine and buprenorphine, as part of a 28-day outpatient opioid detoxification protocol, in a double-blind, randomized controlled trial [5]. Clonidine and buprenorphine were both effective at reducing OW symptoms, but compared to the clonidine group, youth in the buprenorphine arm had fewer opioid-positive urines and were more likely to remain in treatment and initiate a non-agonist maintenance treatment.

Given these findings, buprenorphine should be the detoxification agent of choice in youth with moderate-to-severe OUD and has shown to be effective in outpatient and inpatient settings. For youth and families of youth with less severe OUD or those that are interested in non-opioid detoxification medications, clonidine has also reduced withdrawal symptoms, but is associated with poorer treatment engagement compared to buprenorphine [5].

Alcohol Withdrawal Syndrome

Alcohol withdrawal syndrome (AWS) is rare in adolescents. Presenting symptoms may include anxiety, tremor, diaphoresis, elevated blood pressure, nausea/vomiting, headache, auditory/visual hallucinations, or in rare cases in adolescents, seizures. To date, no controlled studies have examined pharmacotherapy interventions for AWS in adolescents. Any individual presenting with an alcohol use disorder (AUD) should be evaluated for AWS. Clinical guidelines for AWS in youth are modeled after best practices in adults. Benzodiazepines are currently the first line of pharmacotherapy for treatment of AWS in adults. Consensus guidelines suggest that adolescents with severe AUD who present with moderate-to-severe AWS should be treated with benzodiazepines in inpatient treatment settings [7].

Medications for Maintenance SUD Treatment

Opioid Use Disorder Pharmacotherapies

Opioid maintenance pharmacotherapy can broadly be categorized into agonist (buprenorphine and methadone) and antagonist (naltrexone) treatments. OUD pharmacotherapy should always be provided in conjunction with psychosocial interventions. The intensity of clinical management and consideration for MAT in adolescents should be based on the severity of opioid use and the presence of negative prognostic factors such as intravenous drug use, overdose risk, co-occurring psychiatric disorders, and prior failed psychosocial treatments [2]. Treatment of youth with mild-to-moderate severity OUD and few negative prognostic factors should involve medically assisted detoxification for OWS when indicated, followed by psychosocial interventions. Adolescents with severe OUD or multiple negative prognostic factors usually require higher-intensity treatment (e.g., inpatient/residential care) and are more likely to benefit from adjunctive OUD pharmacotherapy [6, 8]. Indeed, the American Academy of Pediatrics now recommends that adolescents with severe OUD routinely receive MAT.

How long youth with OUD should remain on maintenance pharmacotherapy is unclear. Growing evidence from naturalistic studies support the use of MAT with buprenorphine, methadone, and naltrexone in young adults with OUD [9]. Conversely, few pharmacotherapy trials have been completed in adolescents and none for longer than 12 weeks. The potential harms of long-term agonist-based maintenance treatment for adolescent OUD have not yet been studied [10]. For providers considering OUD pharmacotherapy in adolescents, the possible negative effects of chronic opioid agonism on brain development must be weighed against the risk for overdose and impact on brain development of persistent versus intermit-

tent street opiate/opioid use. More research is needed to clarify the efficacy and safety of long-term agonist treatment in this population.

Methadone

Methadone maintenance treatment (MMT) is currently FDA-approved for individuals under 18 with OUDs that have had two or more treatment failures of drug-free detoxification followed by psychosocial interventions [10]. In practice, this restriction, combined with the poor availability of methadone maintenance programs who accept individuals under 18, has resulted in exceptionally few adolescents who receive methadone for OUD treatment. To date, no controlled studies examining MMT for the treatment of adolescent OUD exist. Much of the literature that has informed MMT guidelines in youth is older (1970s) and used naturalistic or observational study designs.

Buprenorphine

Buprenorphine, a partial agonist of the mu-opioid receptor, is FDA-approved for OWS and maintenance OUD treatment in individuals 16 years or older. A multisite randomized clinical trial completed through the NIDA Clinical Trials Network (CTN) in adolescents and young adults (n = 152) examined 2-week short-term buprenorphine-naloxone detoxification (detox group) versus 8-week extended medication-assisted therapy with buprenorphine-naloxone [6]. The results of the study showed that compared to the detox + counseling group, the group receiving buprenorphine-naloxone maintenance pharmacotherapy and counseling had more opioid-negative urines during active treatment, but that after discontinuing the buprenorphine-naloxone, youth in the maintenance group quickly relapsed, and there were no group differences in opioid outcomes at 12-month follow-up. This study converges with the adult OUD literature and suggests that continued maintenance treatment with buprenorphine-naloxone may be crucial to sustain opioid abstinence in youth.

Naltrexone

Naltrexone, a mu-opioid receptor antagonist, blocks the rewarding effects of opioids. It is available in daily oral (oral naltrexone) and monthly injectable (extended-release naltrexone [XR-naltrexone]) formulations. One study to date, a single open-label prospective case series, has examined XR-naltrexone for the treatment of adolescent and young adult OUD. The results of this study indicated that XR-naltrexone was well-tolerated and associated with clinical improvement in youth with OUD. In addition, it demonstrated the feasibility of using XR-naltrexone as part of an OUD outpatient treatment for youth [11].

Alcohol Use Disorder Pharmacotherapies

Advancement of pharmacotherapies for AUD in adults has expanded the treatment options beyond behavioral therapy. In adults naltrexone, acamprosate, and disulfiram are FDA-approved for the treatment of AUD. Please refer to Case 6 in Section IV for further details on these medications and how they may be used in clinical practice.

Naltrexone

Naltrexone, in both oral and XR formulations, has been shown to reduce the number of heavy-drinking days and relapse rates in adult AUDs. While no studies exist on the use of long-acting injectable naltrexone in adolescent AUD, two small clinical studies have examined the effects of oral short-acting naltrexone. The first study was an outpatient-based 6-week open-label pilot study. In this study, oral naltrexone was well-tolerated in adolescents with AUD and led to reductions in drinks per day (8.9 to 1.3 drinks) and alcohol-related thoughts/obsessions [12]. The second study was a randomized double-blind placebo-controlled 4-week crossover study. Compared to placebo, naltrexone was associated with reductions of heavy-drinking days and an attenuation of alcohol cravings and subjective response to alcohol during a laboratory challenge [13].

Disulfiram

Disulfiram is an aversive agent that irreversibly binds to the enzyme aldehyde dehydrogenase, resulting in accumulation of acetaldehyde when alcohol is consumed and producing aversive symptoms. One study has been completed in adolescents, a 90-day double-blind placebo-controlled study compared disulfiram (200 mg/day) to placebo in 26 adolescents receiving AUD outpatient treatment [14]. The study results indicated that disulfiram was well-tolerated and not associated with adverse events. Compared to the group receiving placebo, the disulfiram group had more cumulative days of abstinence and higher rates of sustained abstinence. However, this medication should be used with caution, given the potential severity of the disulfiram reaction when combined with alcohol. The coerced administration of this medication to individuals under the age of 18 also raises potential ethical concerns.

Topiramate

Topiramate is an FDA-approved anticonvulsant for the treatment of seizure disorders and migraines that has been studied extensively in adult AUD and shown to be associated with reductions in heavy drinking and relapse rates. Preliminary findings

from a small, 5-week, double-blind placebo-controlled study of topiramate (doses up to 200 mg/day) in heavy-drinking youth (ages 14–24 years) not enrolled in treatment indicate that it is safe and well-tolerated and may reduce drinks per week (-1.8 drinks/week) [15].

Ondansetron

Ondansetron is a selective serotonin 5-HT_3 receptor antagonist FDA-approved for the treatment of nausea and vomiting. A small ($n = 12$) open-label pilot study examined ondansetron in combination with cognitive behavioral therapy for 8 weeks in adolescents meeting DSM-IV criteria for alcohol dependence [16]. Ondansetron was well-tolerated and the participants had a significant reduction in drinks per day (-1.7 drinks). Additionally, a randomized controlled study of ondansetron in alcohol-dependent adults showed that individuals with early-onset adult AUD had a better response [17].

Acamprosate

Acamprosate, a N-methyl-D-aspartate (NMDA) receptor modulator, is approved by the FDA as a pharmacologic treatment for AUDs in individuals >18 years of age [18]. It is hypothesized to promote balance in excitatory-inhibitory neurotransmission by altering gamma-aminobutyric acid (GABA) and glutamatergic activity and, in doing so, to reduce "protracted" withdrawal symptoms and cravings [19]. It has been shown to improve alcohol-related outcomes (i.e., increase abstinence rates, reduce relapse, and reduce heavy drinking) in adult AUDs with comparable effect sizes to oral naltrexone [18]. Acamprosate has not been systematically studied in adolescents.

Cannabis Use Disorder Pharmacotherapies

There are no FDA-approved medications for the treatment of cannabis use disorder (CUD) at this time. As cannabis use modulates glutamatergic and GABAergic activity in the brain, pharmacotherapies that target these systems have shown promise as agents that aid with cannabis cessation [2, 3].

N-Acetylcysteine (NAC)

NAC is a cysteine prodrug that modulates intracellular and extracellular glutamate by way of the cysteine-glutamate exchanger. There has been one open-label and one RCT examining NAC in adolescents and young adults meeting DSM-IV criteria for cannabis dependence [20, 21]. Findings from these studies suggest that NAC is safe,

is well-tolerated, and when combined with contingency management (CM) interventions, is associated with significant reductions in cannabis use. Further support for the role of NAC for youth CUD comes from a large multisite placebo-controlled trial of NAC in adults (ages 18–50) with CUD [22]. While the main study results showed no group differences between NAC and placebo (indicating limited effect in adults), post hoc analyses, despite being underpowered, found that young adults (ages 18–21) receiving NAC compared to placebo had double the rates of abstinence (OR = 2.0, $p = 0.18$).

Topiramate

One controlled trial has examined the efficacy of topiramate in conjunction with motivational interviewing for the treatment of heavy cannabis-using youth (ages 15–24) [23]. The topiramate group experienced greater side effect burden and higher dropout rates compared to the placebo group. Considering the poor tolerability and inconsistent effect on cannabis use outcome measures, topiramate likely does not have a role in the treatment of adolescent CUDs.

Gabapentin

Gabapentin modulates the GABAergic system and represents a potential pharmacotherapy for CUD. While no studies have been completed in adolescents, a randomized, double-blind, placebo-controlled clinical trial in adults (ages 18–65) that included young adults found that patients receiving gabapentin experienced a greater reduction in the number of days of marijuana use and greater reductions in withdrawal symptoms and cravings than the placebo group [24].

Tobacco Use Disorder Pharmacotherapies

Meta-analyses in adults with tobacco use disorders (TUDs) have shown that medications in conjunction with evidence-based psychosocial interventions are more effective for smoking cessation than either medication or psychosocial intervention alone. Adolescent tobacco cessation studies have shown promising results but generally reported more mixed findings [2, 25].

Nicotine Replacement Therapy (NRT)

NRT is an agonist-based harm reduction pharmacotherapy approach that is FDA-approved for individuals aged 18 and older for smoking cessation. Although these agents can be prescribed to individuals under 18, they cannot be sold legally to a

minor over the counter. The use of NRT (monotherapy or combined) is associated with increased likelihood of abstinence and tobacco cessation in adults when compared with placebo. To date, five studies including a total of 728 subjects have examined NRT for the treatment of tobacco cessation in adolescents [25, 26]. These findings collectively suggest that nicotine patch, but not nicotine gum or nasal spray, has short-term efficacy for tobacco cessation in adolescents, but relapse after discontinuation of NRT is a significant concern. In practice, the nicotine patch is typically prescribed to provide a basal amount of nicotine throughout the day to reduce cravings, and in addition, the short-acting nicotine lozenges, gum, nasal spray, and inhaler are also prescribed for breakthrough cravings.

Sustained-Release Bupropion (Bupropion SR)

Bupropion is a nicotinic receptor antagonist and dopamine and norepinephrine reuptake inhibitor. The sustained-release (SR) formulation of bupropion is FDA-approved for tobacco cessation in adults. To date, bupropion has been examined for adolescent tobacco cessation in 4 randomized controlled trials including a total of 688 subjects [25, 27, 28]. Cumulatively these studies suggest that bupropion SR (300 mg/day dosing) improves tobacco abstinence in adolescents with TUDs, especially when combined with psychosocial interventions and CM.

Varenicline

Varenicline is an α4β2 nicotinic receptor partial agonist. It works by modulating dopaminergic neurotransmission to counteract nicotine withdrawal symptoms (nicotinic agonism) and reducing smoking reinforcement (nicotinic antagonism). The medication received FDA approval for smoking cessation in adults in 2006. Only one trial of varenicline for adolescent smoking cessation has been published. This was an 8-week RCT comparing varenicline with bupropion (bupropion XL) for adolescent smoking cessation. Both groups demonstrated reductions in number of cigarettes per day [28]. There were no statistically significant between-group differences on any of the outcome measures, given the sample size the study was underpowered. At the time of approval, the FDA originally added a black box warning label for varenicline and bupropion for depression and suicidality. In 2016, after subsequent studies and post-market surveillance showed that the risk for depression and suicidality was lower than initially believed, the FDA removed the warning label for varenicline [29].

In summary, providers may consider NRT, bupropion SR, or varenicline to aid tobacco cessation in adolescent smokers who fail to respond to psychosocial interventions. Studies from adults suggest that combination therapy (i.e., varenicline plus nicotine replacement therapy or bupropion plus nicotine replacement therapy)

is more effective than monotherapy. Combination therapy has not yet been thoroughly studied for adolescents under 18.

Medications for Opioid Overdose

Opioid overdose deaths in adolescents (aged 15–19) have more than tripled from 1999 to 2007 and in 2015 were 2.4 per 100,000 [30]. To address this public health crisis, the intranasal formulation of naloxone is increasingly available from pharmacies and handed out in communities. An intramuscular formulation is also available but less commonly used in most communities. Naloxone is an opioid antagonist and overdose rescue agent that can be prescribed for patients with OUDs and concerned family members to be administered by laypersons in the community if they observe an opioid overdose. No trials have been completed in adolescents or young adult samples. Still, clinicians who treat youth with OUDs should strongly consider prescribing intranasal naloxone and providing education and training to patients and concerned family members about the signs/symptoms of opioid intoxication and what to do in the event of a suspected overdose [25, 31].

Medications to Treat Co-occurring/Comorbid Psychiatric Conditions

To date, controlled studies of pharmacotherapies have been completed for depression, bipolar disorder, and attention deficit/hyperactivity disorder (ADHD) in youth with SUDs [2]. For additional details, refer to Chap. 5: "Co-occurring Mental Health Disorders."

Conclusions

Based upon the high morbidity and mortality related to alcohol and drug use in adolescents, providers should aggressively treat youth SUDs. Findings from early controlled studies have been mixed, but suggest that medications approved to treat SUDs in adults are generally safe and well-tolerated in youth. In some adolescents, especially those who have failed to improve with psychosocial treatment alone, there may be a role for adjunctive pharmacotherapy (see Table 7.2). The strongest evidence to date exists for pharmacotherapies targeting opioids, alcohol, tobacco, and cannabis use disorders. When using these medications, providers should monitor patients closely for side effects and efficacy and when possible coordinate with parents and family members to enhance medication adherence.

Table 7.2 Core principles for medications for addiction treatment in adolescent and young adult substance use disorders

	Core principles
1.	A broad range of psychotropic medications with different mechanisms of action and side effect profiles appear to be well-tolerated and not associated with increased side effect burden in youth who are actively using alcohol and other drugs
2.	There may be a role for adjunctive pharmacotherapies in specific subgroups of adolescents with substance use disorders for the treatment of withdrawal symptoms and cravings and to aid in relapse prevention by reducing the reinforcing effects of drugs. These medications may improve outcomes when combined with psychosocial interventions
3.	Providers should consider adjunctive pharmacotherapies in youth with mild-to-moderate SUDs who have failed to achieve abstinence within the first 4–6 weeks of psychosocial interventions alone
4.	Providers should consider adjunctive pharmacotherapies in youth with SUDs who have high severity substance use problems or other negative prognostic factors such as (1) co-occurring psychiatric disorders, (2) intravenous drug use, (3) history of overdoses or near overdoses, and (4) frequent risky behaviors while intoxicated that place them at high risk for injury or death (e.g., driving under the influence of alcohol or drugs, unprotected sexual intercourse, accidents)
5.	Providers should obtain information on the client's past response to medications, contraindications, adherence, and drug-to-drug interactions between medication and commonly used substances
6.	Medication-related psychoeducation with the patient and family should address the risks vs. benefits, possible side effects of a medication, and alternative treatments. These risks and benefits should be weighed against the risks of continued substance use
7.	The family's willingness to monitor the patient's medication adherence can improve treatment outcomes

Take-Home Points

- Adding pharmacotherapies to evidence-based psychosocial interventions may be an effective enhancement strategy in adolescents and young adult with substance use disorders (SUDs).
- Compared to extensive treatment research in adult SUDs, relatively few controlled pharmacotherapy trials have been conducted in adolescents and young adults with SUD.
- Medications that are FDA-approved to treat addictive disorders in adults have generally been shown to be safe and well-tolerated in youth with SUD who are actively using alcohol or other drugs.
- Buprenorphine is the only medication with an FDA-approved indication for the treatment of adolescent SUDs, specifically for opioid use disorders.
- "Off-label" addiction medications that have shown promise in controlled trials in youth include nicotine replacement therapy and bupropion for tobacco use disorders and *N*-acetylcysteine for cannabis use disorders.

- Providers considering a pharmacotherapy trial in youth with SUDs should use the adolescent's addiction severity, initial response to psychosocial treatment, risk for negative outcomes (i.e., overdose and injuries/accidents), and presence of co-occurring psychiatric disorders to guide clinical decision-making.

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References

1. Winters KC, Tanner-Smith EE, Bresani E, Meyers K. Current advances in the treatment of adolescent drug use. Adolesc Health Med Ther. 2014;5:199–210.
2. Hammond CJ, Gray KM. Pharmacotherapy for substance use disorders in youths. J Child Adolesc Subst Abuse. 2016;25(4):292–316.
3. Hammond CJ, Mayes LC, Potenza MN. Neurobiology of adolescent substance use and addictive behaviors: treatment implications. Adolesc Med State Art Rev. 2014;25(1):15–32.
4. O'Brien CP. Anticraving medications for relapse prevention: a possible new class of psychoactive medications. Am J Psychiatry. 2005;162(8):1423–31.
5. Marsch LA, Bickel WK, Badger GJ, Stothart ME, Quesnel KJ, Stanger C, et al. Comparison of pharmacological treatments for opioid-dependent adolescents: a randomized controlled trial. Arch Gen Psychiatry. 2005;62(10):1157–64.
6. Woody GE, Poole SA, Subramaniam G, Dugosh K, Bogenschutz M, Abbott P, et al. Extended vs short-term buprenorphine-naloxone for treatment of opioid-addicted youth: a randomized trial. JAMA. 2008;300(17):2003–11.
7. Clark DB. Pharmacotherapy for adolescent alcohol use disorder. CNS Drugs. 2012;26(7):559–69.
8. Subramaniam GA, Warden D, Minhajuddin A, Fishman MJ, Stitzer ML, Adinoff B, et al. Predictors of abstinence: National Institute of Drug Abuse multisite buprenorphine/naloxone treatment trial in opioid-dependent youth. J Am Acad Child Adolesc Psychiatry. 2011;50(11):1120–8.
9. Vo HT, Robbins E, Westwood M, Lezama D, Fishman M. Relapse prevention medications in community treatment for young adults with opioid addiction. Subst Abus. 2016;37(3):392–7.
10. Lowinson JH, Marion IL, Joseph H, Dole VP. Methadone maintenance. In: Lowinson JH, Ruiz P, Millman RB, editors. Substance abuse: a comprehensive textbook. 2nd ed. Baltimore: Williams and Wilkins; 1992.
11. Fishman MJ, Winstanley EL, Curran E, Garrett S, Subramaniam G. Treatment of opioid dependence in adolescents and young adults with extended release naltrexone: preliminary case-series and feasibility. Addiction. 2010;105(9):1669–76.
12. Deas D, May MP, Randall C, Johnson N, Anton R. Naltrexone treatment of adolescent alcoholics: an open-label pilot study. J Child Adolesc Psychopharmacol. 2005;15(5):723–8.
13. Miranda R, Ray L, Blanchard A, Reynolds EK, Monti PM, Chun T, et al. Effects of naltrexone on adolescent alcohol cue reactivity and sensitivity: an initial randomized trial. Addict Biol. 2014;19(5):941–54.
14. Niederhofer H, Staffen W. Comparison of disulfiram and placebo in treatment of alcohol dependence of adolescents. Drug Alcohol Rev. 2003;22(3):295–7.
15. Monti PM, Miranda R, Justus A, et al. Biobehavioral mechanisms of topiramate and drinking in adolescents: preliminary findings. Neuropharmacology. 2010;35:S164.
16. Dawes MA, Johnson BA, Ait-Daoud N, Ma JZ, Cornelius JR. A prospective, open-label trial of ondansetron in adolescents with alcohol dependence. Addict Behav. 2005;30:1077–85.

17. Johnson BA, Roache JD, Javors MA, DiClemente CC, Cloninger CR, Prihoda TJ, Hensler J. Ondansetron for reduction of drinking among biologically predisposed alcoholic patients: a randomized controlled trial. JAMA. 2000;284(8):963–71.
18. Kranzler HR, Van Kirk J. Efficacy of naltrexone and acamprosate for alcoholism treatment: a meta-analysis. Alcohol Clin Exp Res. 2001;25(9):1335–41.
19. Witkiewitz K, Saville K, Hamreus K. Acamprosate for treatment of alcohol dependence: mechanisms, efficacy, and clinical utility. Ther Clin Risk Manag. 2012;8:45–53.
20. Gray KM, Watson NL, Carpenter MJ, Larowe SD. N-acetylcysteine (NAC) in young marijuana users: an open-label pilot study. Am J Addict. 2010;19(2):187–9.
21. Gray KM, Carpenter MJ, Baker NL, DeSantis SM, Kryway E, Hartwell KJ, et al. A double-blind randomized controlled trial of N-acetylcysteine in cannabis-dependent adolescents. Am J Psychiatry. 2012;169(8):805–12.
22. Gray KM, Sonne SC, McClure EA, et al. A randomized placebo-controlled trial of N-acetylcysteine for cannabis use disorder in adults. Drug Alcohol Depend. 2017;177:249–57.
23. Miranda R Jr, Treloar H, Blanchard A, Justus A, Monti PM, Chun T, et al. Topiramate and motivational enhancement therapy for cannabis use among youth: a randomized placebo-controlled pilot study. Addict Biol. 2017;22(3):779–90.
24. Mason BJ, Crean R, Goodell V, Light JM, Quello S, Shadan F, et al. A proof-of-concept randomized controlled study of gabapentin: effects on cannabis use, withdrawal and executive function deficits in cannabis-dependent adults. Neuropsychopharmacology. 2012;37(7):1689–98.
25. Hammond CJ. The role of pharmacotherapy in the treatment of adolescent substance use disorders. Child Adolesc Psychiatr Clin N Am. 2016;25(4):685–711.
26. Moolchan ET, Robinson ML, Ernst M, Cadet JL, Pickworth WB, Heishman SJ, Schroeder JR. Safety and efficacy of the nicotine patch and gum for the treatment of adolescent tobacco addiction. Pediatrics. 2005;115:e407–14.
27. Muramoto ML, Leischow SJ, Sherrill D, Matthews E, Strayer LJ. Randomized, double-blind, placebo controlled trial of 2 dosages of sustained-release bupropion for adolescent smoking cessation. Arch Pediatr Adolesc Med. 2007;161:1068–74.
28. Gray KM, Carpenter MJ, Lewis AL, Klintworth EM, Upadhyaya HP. Varenicline versus bupropion XL for smoking cessation in older adolescents: a randomized, double-blind pilot trial. Nicotine Tob Res. 2012;14(2):234–9.
29. FDA Drug Safety Communication: FDA revises description of mental health side effects of the stop-smoking medicines Chantix (varenicline) and Zyban (bupropion) to reflect clinical trial findings. 2016; available at https://www.fda.gov/Drugs/DrugSafety/ucm532221.htm. Accessed 31 Jan 2018.
30. Curtin SC, Tejada-Vera B, Warner M. Drug overdose deaths among adolescents aged 15–19 in the United States: 1999–2015. NCHS data brief, no 282. Hyattsville, MD: National Center for Health Statistics. 2017. https://www.cdc.gov/nchs/products/databriefs/db282.htm. Accessed 31 Jan 2018.
31. Substance Abuse and Mental Health Services Administration (SAMHSA). SAMHSA Opioid overdose prevention toolkit. Rockville: Substance Abuse and Mental Health Services Administration (SAMHSA); 2014. Vol HHS Publ No. (SMA) 14–4742.

Suggested Reading

Hammond CJ. The role of pharmacotherapy in the treatment of adolescent substance use disorders. Child Adolesc Psychiatr Clin N Am. 2016;25(4):685–711.
Hammond CJ, Gray KM. Pharmacotherapy for substance use disorders in youths. J Child Adolesc Subst Abuse. 2016;25(4):292–316.

Part III
Prevention and Recovery

Chapter 8
Prevention

Banku Jairath, Laura Duda, and Leslie R. Walker-Harding

Types of Prevention

In a 1994 report on prevention research, the Institute of Medicine (IOM 1994) proposed a new framework for classifying prevention based on Gordon's (1987) operational classification of disease prevention [1]. The three types of prevention are universal, selective, and indicated.

Universal

Universal prevention targets an entire population (national, local, community, school, or neighborhood) with messages and programming aimed at preventing or delaying the use of alcohol, tobacco, and other drugs. The goal of universal prevention strategies is to avert the onset of substance use by providing information and necessary skills. The entire adolescent population is considered at risk and able to benefit from this type of prevention programming. Prevention materials are delivered to large groups (e.g., in school or primary care physician offices) without any prior screening for substance use risk [1].

B. Jairath (✉)
Department of General Pediatrics, Penn State Hershey Children's Hospital at the Milton S. Hershey Medical Center, Hershey, PA, USA
e-mail: bjairath@pennstatehealth.psu.edu

L. Duda
Department of Pediatrics, Penn State Children's Hospital at the Milton S. Hershey Medical Center, Hershey, PA, USA

L. R. Walker-Harding
Department of Pediatrics, Penn State Children's Hospital, Hershey, PA, USA

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Selective

Selective interventions are directed toward individuals with a higher-than-average risk for substance use. Selective prevention measures target subsets of the adolescent population that are considered at risk for substance use disorder by virtue of their membership in a particular segment of the population. Selective prevention focuses on the entire subgroup, regardless of the degree of risk of any individual within the group [1].

Indicated

Indicated interventions target individuals who are already using substances or are engaged in other high-risk behaviors in order to prevent heavy or chronic use. Indicated prevention measures are designed to prevent the onset of regular substance use in individuals who do not yet meet the medical criteria for a substance use disorder but are showing early warning signs. The mission of indicated prevention is to identify individuals who are exhibiting problem behaviors and to involve them in special programs [1].

The aforementioned levels of prevention occur as a continuum from universal to indicated prevention (Fig. 8.1).

Risk Factors and Protective Factors

Research has identified numerous individual-level factors that are associated with the likelihood of substance use [2]. Risk and protective factors are organized into community, school, family, and individual/peer factors (Fig. 8.2).

Risk factors are qualities of a child or adolescent, or his or her environment, which increase the likelihood of later substance use [3]. The availability of substances varies, with some communities having greater availability (e.g., more liquor stores or marijuana dispensaries). Communities with higher availability have

Fig. 8.1 Prevention levels as a continuum

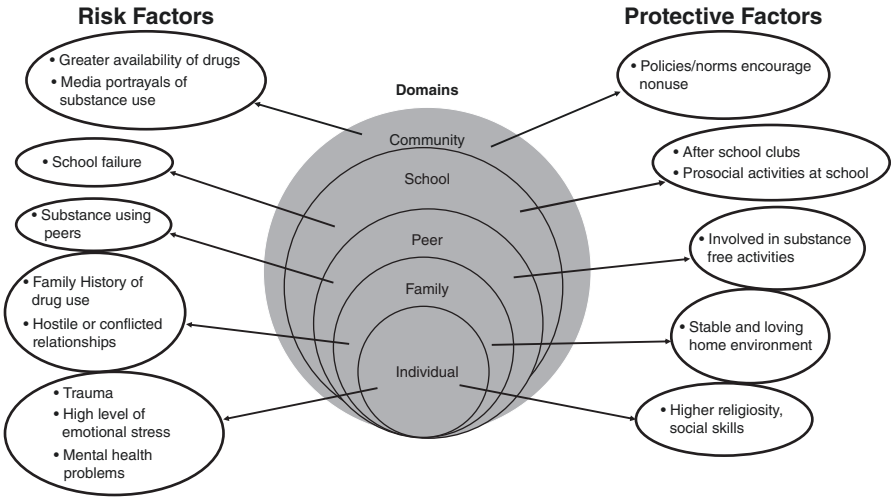

Fig. 8.2 Risk and protective factors in different domains

typically demonstrated elevated rates of adolescent substance use [4]. Perhaps influencing an adolescent's perception of substance availability or acceptability, media portrayals of substance use (ranging from alcohol advertisements to movies featuring substance use) have also been linked to earlier initiation of substance use [5].

In the family domain, parental attitudes toward drug use are similarly predictive of later adolescent use. Adolescents are more likely to engage in substance use behavior when their parents have favorable or approving attitudes toward drug or alcohol use. Additionally, adolescents raised in families with high levels of conflict are also more likely to use substances and later develop substance use problems [3].

In the individual and peer domains, several constitutional factors have emerged as consistent predictors of later substance use. Individuals characterized as having a higher degree of sensation-seeking, risk-taking, impulsivity, or low harm avoidance are more likely to engage in substance use behaviors [3]. Similarly, adolescents who display more frequent and higher levels of childhood aggressive behavior, and antisocial behavior in early adolescence, are also more likely to engage in substance use behaviors [3]. Having friends who engage in antisocial behaviors, and being friends with peers who use substances, also predicts later substance use. The earlier an adolescent initiates substance use, the more likely he or she is to develop substance use problems later in life [3].

Protective factors are qualities of children and their environments that promote successful coping and adaptation to life situations and change. Protective factors are not simply the absence of risk factors; rather, they may reduce or lessen the negative impact of risk factors [6]. All children have a mix of risk and protective factors. An important goal of prevention is to change the balance between these so that the effects of protective factors outweigh those of risk factors. Risk and protective factors may be *internal* to the child (such as genetic or personality traits or specific behaviors) or *external* (i.e., arising from the child's environment or context), or they may come from the interaction between internal and external influences.

Opportunities for prevention exist in programs that seek not only to decrease risk factors but also to increase protective factors. For example, during adolescence, opportunities for prosocial involvement, such as after-school clubs, youth organizations, and community events, act protectively against substance use [7]. Similarly, recognition for involvement in prosocial activities at school is also protective against substance use behaviors [7]. At the family level, a similar trend emerges, where opportunities for prosocial involvement in the family, such as game nights, and opportunities to help with chores are similarly associated with fewer substance use behaviors, as is family recognition of involvement in healthy activities [7]. Finally, at the individual level, higher religiosity and social skills are all protective factors for adolescent substance use.

Examples of Programs (Table 8.1)

Community Programs

Prevention programs aimed at the general population of children and adolescents during key times of transition, such as the progression to middle school and high school, can produce beneficial effects even among high-risk families and children. In most cases, prevention programs do not single out high-risk

Table 8.1 Summary of prevention programs

Name of program	Type of program	Program description
Communities That Care	Community-based	Assesses risk and protective factors in a particular community and recommends programs
Prosper	Community-based	Evidence-based delivery system for programs for sixth and seventh graders
Positive Action	School-based	Targets preschool and elementary students to promote positive educational environment and cooperative learning
The Botvin Life Skills Training	School-based	Three-year program for middle schoolers that focuses on peer relations, decision-making, goal setting, and substance use
Michigan Model for Health	School-based	Health education curriculum for kindergarten through 12th grade promoting healthy behaviors
Preventure	School-based	Counseling sessions for high-risk youth targeted to personality types
Nurse-Family Partnership	Family-based	Nurse visits for first-time, single mothers from prenatal until the child is 2 years old
Strengthening Families	Family-based	Counseling sessions with family to improve resiliency and address behaviors
Guiding Good Choices	Family-based	Parent training sessions that focus on improving communication

Additional information for the programs in this table can be found at https://www.samhsa.gov

populations and serve not only to prevent the initiation and progression of substance but also to reduce stigma and promote bonding of adolescents to their schools and communities [8].

Evidence-based substance use prevention programs delivered to entire communities typically have multiple components. These often include school-based, family, and parenting components, along with mass media campaigns, public policy initiatives, and other types of community organization and activities. These interventions require a significant amount of resources and coordination, given the broad scope of the activities involved. Program components are often managed by a coalition of stakeholders including parents, educators, and community leaders. Research has shown that community-based programs that deliver a coordinated, comprehensive message about prevention can be effective in preventing adolescent substance use [9].

Although a full review of all community-based prevention programs is beyond the scope of this chapter, here we review two commonly used evidence-based programs, Communities That Care and PROSPER.

Communities That Care (CTC)

Communities That Care is a model of evidence-informed community practice to improve school functioning and reduce high-risk behaviors including substance use. Communities are empowered to use their own local data on levels of risk and protection as diagnostic information to guide the selection of preventive interventions that address the community's profile [6]. Through this program, community members receive assistance collecting data on risk and protective factors among constituents in order to develop what is referred to as a "community profile." Using these data, communities then select prevention services focusing on the highest-risk geographic areas. Within these targeted areas, the most prominent factors are identified and prioritized, and evidence-based prevention interventions are selected for implementation. This approach is most effective due to its implementation of prevention interventions tailored to local risk and protective factors. The programming also empowers the community to choose from a growing number of tested interventions suited to the community demographic composition. This enhances community ownership and commitment to implementation of the preventive interventions selected [6]. A full review of CTC, a complex community-based intervention, is beyond the scope of this chapter, but further details are available at https://www.communitiesthatcare.net.

PROSPER

PROSPER (PROmoting School-community-university Partnerships to Enhance Resilience) is one of the few childhood interventions that has demonstrated enduring effects in the prevention of substance use progression through young adulthood.

PROSPER is a delivery system that utilizes an outreach arm, the Cooperative Extension System (CES), to catalyze community teams to deliver evidence-based school- and family-focused interventions targeting middle school students.

The PROSPER delivery system model consists of:

1. Teams of community stakeholders linked with public schools and led by local CES staff
2. Prevention Coordinators (PCs) connected with the CES
3. A team of state-level researchers and CES faculty

PCs serve as liaisons between the community and university teams, providing ongoing, proactive technical assistance, implementation oversight, and evaluation to community teams to optimize team functioning and program delivery [10]. A full review of PROSPER is beyond the scope of this chapter, and further details are available at www.helpingkidsprosper.org.

School-Based Programs

School-based prevention programs have varied approaches depending on the targeted age group. Effective programs typically incorporate one or more of the following components: substance use education, teacher instruction and classroom management, cognitive and social development, and tutoring [11]. School-based prevention programs may also focus on reducing risk factors such as academic underperformance or increasing protective factors such as school involvement, parental involvement in schools, and offering positive after-school activities.

Positive Action is a program that targets students in preschool and elementary years. The curriculum promotes a positive educational setting and cooperative learning and has been shown to reduce substance use in adolescence. Positive Action's programming is implemented from kindergarten to sixth grade and has a unit in each grade focusing on various concepts such as "managing yourself responsibly" and "telling yourself the truth" [12].

The Botvin Life Skills Training is a 3-year program implemented in middle school that focuses on peer relations, decision-making, goal setting, and education about substance use. This program involves 15 classes in the first year of the program, 10 in the second year, and 5 in the third year. Five- and 6-year follow-up demonstrates a cost-effective reduction in substance use; participants had a 21% decrease in smoking initiation, 23% decrease in marijuana use, and 11% decrease in alcohol intoxication [13]. Long-term follow-up of participants in Life Skills shows sustained reductions in prescription substance use persisting well into young adulthood [14].

The Michigan Model for Health is a school-based program that delivers short classroom lessons from kindergarten through 12th grade. The lessons cover aspects of healthy lifestyles including nutrition and substance use. Research has shown that this program reduces initiation and alcohol use in students who participated [15].

Preventure is a school-based targeted intervention for high-risk adolescents. Tailored interventions are delivered based on a student's scores in higher-risk personality dimensions including anxiety, hopelessness, and impulsivity. Students with scores one standard deviation or above the school mean are offered to participate in two 90-min workshops. Participants of these workshops have demonstrated lower rates of drinking and binge drinking at 6- and 24-month follow-up [16].

Project ALERT is a series of 11 lessons focused on developing motivation and skills to resist drugs, alcohol, and tobacco. The curriculum is implemented in seventh and eighth grade students. The program was effective in decreasing marijuana and cigarette use in eighth graders, but these decreases were not sustained into high school [17].

The Drug Abuse Resistance Education (DARE) program was widely implemented in schools in the 1980s and 1990s and is still being used in some settings despite lacking evidence. The curriculum includes 16 weeks of protocol-driven instruction delivered in elementary school. However, 5- and 10-year follow-ups have demonstrated no reduction in substance use when compared to similarly aged peers who did not participate in the program [18].

Family-Based Programs

Family-based interventions focus on the relationship between child and parent(s) to prevent substance use. Parenting styles that include lax monitoring and/or harsh consequences can contribute to adolescent substance use [19]. Additionally, parenting styles that are overly rigid or uninvolved can diminish open and effective communication about substances. Parent/adolescent communication plays a large role in prevention of substance use. Adolescents who feel a high level of bonding and support from their families are approximately half as likely to develop a substance use disorder [19].

Most family-based programs focus on parenting skills to establish clear expectations for behavior, manage conflicts and anger, and build healthy family bonds. Like the school-based programs, these programs target a range of ages. Nurse-Family Partnership provides support and education for first-time, single mothers from the prenatal period until the child is 2 years old. The program is currently implemented in 31 states across the nation and has demonstrated a significant reduction in substance use among 15-year-olds [20].

Strengthening Families is a family training program implemented at ages 3–16 years. It involves 14, 2-h weekly training sessions that focus on increasing resiliency and reducing behavior problems. Guiding Good Choices is a similar program that targets the parents of students aged 10–14 years. This program involves 5–7 parent training sessions that focus on improving the communication between the child and parent, conflict resolution, and parent-child bonding. A reduction of substance use in the participants through adolescence has been demonstrated from both of these programs [21].

Medical practitioners should also help guide parenting styles and discuss communication between parent and child. They can also refer families to participate in family-based programs. Information about the availability of these programs can be accessed through the individual websites for each program.

Peer and Individual Prevention Interventions

Association with peers who use substances or have deviant behavior is a strong predictor of substance use in adolescence. Conversely, having a peer group that does not use substances is strongly correlated with an adolescent's abstinence from substance use [19]. It is unclear if adolescents choose peer groups that correspond to their individual desire to initiate or abstain from substance use or if they are influenced by their peer group. College students who have high school peers with pro-drinking norms are more likely to engage in heavy drinking by the end of their first semester in college [22].

Data demonstrates that adolescents overestimate their peers' substance use [23]. This is also seen in social media perceptions of use [24]. It is unclear if this overestimation of peers' substance use results in increased personal use. The social norms theory suggests that adolescents who overestimate their peers' use of substances will increase their own use. Programs such as the social norms approach that focus on correcting these misconceptions have been implemented to attempt to decrease substance use in adolescents [25]. However, there is a relative lack of data supporting efficacy of this approach. There is evidence that peer-led prevention programs can be effective in decreasing tobacco and alcohol use by adolescents, but more research is needed to clarify the impact of peers in prevention programs [26].

Children with psychiatric conditions such as mood or anxiety disorders have a higher risk of substance use. Eleven to 48% of adolescents with substance use disorders have co-occurring depression or anxiety, with depression being the most common [27]. Prevention programs that use cognitive behavioral therapy have been successful at reducing symptoms of anxiety and depression in high-risk groups of adolescents [28]. Effective short-term treatment of depression in adolescents has also demonstrated a reduction in the rates of substance use disorders [29]. Identifying and treating depression and anxiety in adolescents may prove to be a valuable substance use prevention tool. Prompt referral to a clinician skilled in the treatment of anxiety and depression can be important in the prevention of future substance use.

Conclusion

There are a variety of different prevention programs that target adolescent substance use. Areas for intervention include not only an adolescent's school—where interventions are most commonly implemented—but also community and home

environments. Evidence not only supports mitigating risk factors but also enhances protective factors in an adolescent's life. Knowledge of the available local prevention resources is essential when working with families. More information about specific prevention programs can be found on the Substance Abuse and Mental Health Services Administration (SAMHSA) National Registry of Evidence-Based Programs and Practices (www.samhsa.gov/nrepp). Historically, this registry included only programs with a positive effect and strong supporting evidence; more recently, this registry has also included programs with a less clear evidence base, so careful assessment of any program is critical prior to implementation.

All clinicians who care for children and adolescents have a unique opportunity to guide utilization of prevention programs by their patients. Please refer to Table 8.1 for a list of prevention programs covered in this chapter. Understanding the details of programs and their evidence-based effectiveness is paramount to helping all youth.

Take-Home Points

- Prevention interventions are classified as universal (targets entire population), selective (targets at-risk individuals), or indicated (targets individuals showing early signs and symptoms of the illness).
- Numerous community-, school-, and family-based prevention programs can reduce substance use with potential effects enduring into early adulthood.
- Effective communication between parents and adolescents is associated with decreased substance use.
- Individual- and peer-level prevention interventions may also reduce the onset of substance use and preventing its progression to a use disorder.
- Evidence-based treatment of anxiety and depression in adolescents may also decrease substance use.

References

1. Kumpfer KL, Baxley GB. Drug abuse prevention: what works? Rockville: National Institute on Drug Abuse; 1997.
2. Catalano RF, Haggerty KP, Hawkins JD, et al. Prevention of substance use and substance use disorders: the role of risk and protective factors. In: Kaminer Y, Winter KC, editors. Clinical manual of adolescent substance abuse treatment. Washington, DC: American Psychiatric Publishing; 2011. p. 25–63.
3. Harrop E, Catalano RF. Evidence-based prevention for adolescent substance use. Child Adolesc Psychiatr Clin N Am. 2016;25(3):387–410.
4. Duncan SC, Duncan TE, Strycker LA. A multilevel analysis of neighborhood context and youth alcohol and drug problems. Prev Sci. 2002;3(2):125–33.
5. Wills TA, Sargent JD, Gibbons FX, Gerrard M, Stoolmiller M. Movie exposure to alcohol cues and adolescent alcohol problems: a longitudinal analysis in a national sample. Psychol Addict Behav. 2009;23(1):23.

6. Hawkins JD, Catalano RF. Communities that care: action for drug abuse prevention. San Francisco: Jossey-Bass; 1992.
7. Beyers JM, Toumbourou JW, Catalano RF, Arthur MW, Hawkins JD. A cross-national comparison of risk and protective factors for adolescent substance use: the United States and Australia. J Adolesc Health. 2004;35(1):3–16.
8. Dishion T, Kavanagh K, Schneiger AKJ, Nelson S, Kaufman N. Preventing early adolescent substance use: a family centered strategy for the public middle school. Prev Sci. 2002;3(3):191–202.
9. Spoth RL, Redmond D, Trudeau L, Shin C. Longitudinal substance initiation outcomes for a universal preventive intervention combining family and school programs. Psychol Addict Behav. 2002;16(2):129–34.
10. Spoth R, Redmond C, Shin C, Greenberg MT, Feinberg ME, Trudeau L. PROSPER delivery of universal preventive interventions with young adolescents: long-term effects on emerging adult substance misuse and associated risk behaviors. Psychol Med. 2017;47(13):2246–59.
11. Ḳaminer Y, Winters K. Clinical manual of adolescent substance abuse treatment. Washington, DC: American Psychiatric Publishing; 2011.
12. Bavarian N, Lewis K, Acock A, DuBase D, Yan Z. Effects of a school based social-emotional and character development program on health behaviors; a matched pair, cluster-randomized controlled trial. J Prim Prev. 2016;37(1):87–105.
13. Spoth R, Randall G, Trudeau L, Shin C, Redmond C. Substance use outcomes 5½ years past baseline for partnership-based, family-school preventive interventions. Drug Alcohol Depend. 2008;96(1–2):57–68.
14. Spoth R, Trudeau L, Shin C, Ralston E, Redmond C, Greenberg M, Feinberg M. Longitudinal effects of universal preventive intervention on prescription drug misuse: three randomized controlled trials with late adolescents and young adults. Am J Public Health. 2013;103(4):665–72.
15. O'Neill JM, Clark JK, Jones JA. Promoting mental health and preventing substance abuse and violence in elementary students: a randomized control study of the Michigan Model for Health. J Sch Health. 2011;81(6):320–30.
16. Conrod PJ, Castellanos-Ryan N, Mackie C. Long-term effects of a personality-targeted intervention to reduce alcohol use in adolescents. J Consult Clin Psychol. 2011;79(3):296–306.
17. Ellickson PL, Bell RM. Drug Prevention in junior high: a multi-site longitudinal test. Science. 1990;247(4948):1299–305.
18. Clayton RR, Cattarello AM, Johnstone BM. The effectiveness of Drug Abuse Resistance Education (project DARE): 5 year follow-up results. Prev Med. 1996;25(3):307–18.
19. Stone A, Becker L, Huber A, Catalano R. Review of risk and protective factors of substance use and problem use in emerging adulthood. Addict Behav. 2012;37(7):747–75.
20. Olds D. The nurse–family partnership: an evidence-based preventive intervention. Infant Ment Health J. 2006;27(1):5–25.
21. Spoth R, Redmond C, Shin C. Randomized trial of brief family interventions for the general populations: adolescent substance use outcomes 4 years following baseline. J Consult Clin Psychol. 2001;69(4):627–42.
22. Sher K, Rutledge P. Heavy drinking across the transition to college: predicting first-semester heavy drinking from precollege variables. Addict Behav. 2007;32(4):819–35.
23. Borsari B, Carey K. Peer influences on college drinking: a review of research. J Subst Abuse. 2001;13(4):391–424.
24. Moreno M, Whitehill J. Influence of social media on alcohol use in adolescents and young adults. Alcohol Res. 2014;36(1):91–100.
25. McAlaney J, Bewick B, Hughes C. The international development of the 'Social Norms' approach to drug education and prevention. Drugs Educ Prev Policy. 2010;18:81–9.
26. MacArthur GJ, Harrison S, Caldwell D. Peer-led interventions to prevent tobacco, alcohol and/or drug use among young people aged 11-21 years: a systematic review and met-analysis. Addiction. 2016;111(3):391–407.

27. O'Neil K, Connor B, Kendall P. Internalizing disorders and substance use disorders in youth: comorbidity, risk, temporal order, and implications for intervention. Clin Psychol Rev. 2011;31(1):104–12.
28. Teubert D, Pinquart M. A meta-analytic review on the prevention of symptoms of anxiety in children and adolescents. J Anxiety Disord. 2011;25(8):1046–59.
29. Curry J, Silva S, TADS Team. Onset of alcohol or substance use disorders following treatment for adolescent depression. J Consult Clin Psychol. 2012;80(2):299–312.

Chapter 9
Addressing Substance Use in Childhood, Adolescence, and Young Adulthood

Ann Bruner and Marc Fishman

Introduction

Substance use typically has its onset in the second decade of life, with the highest prevalence rates of substance use in young adults aged 18–24 years old [1]. The progression to a substance use disorder (SUD), for a subset of those who initiate use, also has a similar timing, with onset in adolescence and peak prevalence in young adulthood. What is often considered an adult health problem is actually a developmental disorder with pediatric onset. Furthermore, many of the vulnerability factors that confer risk for initiation and progression (e.g., problems with maturation of affective regulation skills; exposure to family, neighborhood, and peer use; family chaos and lack of supervision) as well as resilience factors that confer protection (e.g., maturation of self-efficacy skills; academic success; a repertoire of pro-social activities; intact familial, community, and nondeviant peer supports) are most active in childhood and adolescence [2, 3]. Earlier initiation of substance use predicts a greater likelihood of the progression to a SUD, the severity of the SUD, persistence into adulthood, and a poorer prognosis [3, 4]. Conversely, early intervention predicts an earlier and more favorable response and a better prognosis. Family communication is also protective; adolescents who have talked regularly with their parents about drugs and alcohol are at least 40% less likely to use [5].

As with other health conditions with a pediatric onset, substance use should be addressed early in the life course, using the same core principles of education,

A. Bruner
Maryland Treatment Centers, Baltimore, MD, USA

M. Fishman (✉)
Maryland Treatment Centers, Baltimore, MD, USA

Department of Psychiatry, Johns Hopkins University School of Medicine, Baltimore, MD, USA
e-mail: mjfishman@comcast.net

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screening, identification, and referral that are employed for other potentially chronic conditions such as obesity and hypertension. This concept has broad implications for prevention, early intervention, and treatment and supports the case for addressing substance use in pediatric/primary healthcare settings before an adolescent progresses to more advanced stages of substance use and requires presentation to subspecialty care.

Education and prevention strategies should be introduced at a young age and continue through young adulthood, using developmentally appropriate messaging. Substance use education is less complicated in some ways than education regarding other risk behaviors, such as sexuality, in as much as the core message is straightforward and simple: adolescent substance use is harmful and the best decision is to choose not to use. While the majority of individuals under the age of 18 do not use alcohol or drugs, they are aware of substances through exposure to media, family, friends, and neighbors. For parents, there are opportunities at every age to talk about substance use and deliver the clear message that alcohol and drugs are harmful.

A secondary prevention focus is to avoid the progression to an SUD for an adolescent who has already tried alcohol or drugs. In fact, the same message and strategy can remain constant—that is, that alcohol and drugs may be harmful to health, function, and the realization of adolescents' long-term goals and objectives. Similar to discussions about sex, parents need their messaging about substance use to evolve developmentally. The consistent message throughout adolescence should remain that youth abstain from using substances but as they mature that this message is delivered with additional practical guidance about peer pressure, experimentation, making mistakes, and staying safe. For example, parents and caregivers should stress that substances impair judgment which can lead to an increased risk of violence, sexual assault, and motor vehicle crashes. This chapter will review the basics of addressing substance use in childhood, adolescence, and young adulthood, including approaches common to youth overall, and also differentiate strategies with shifting applicability and salience across these developmental stages.

Core approaches for youth of all ages

Engagement

One of the most important core concepts when offering an impactful intervention for substance use is the engagement of the adolescent. Open and explicit communication creates an atmosphere of normalized, less awkward conversation, with the opportunity for thoughtful consideration by the youth, and concerned feedback by the adult. Any discussion, no matter how limited, lays the groundwork for further meaningful exchange and is an investment in potential future impact. This exchange applies to the critical and potent efforts of both caregivers and healthcare providers. The importance of clear messaging imbued with the authority natural to both of these roles cannot be overemphasized.

As in motivational interviewing/motivational enhancement therapy approaches, personalized feedback informed by direct knowledge of the individual is more effective than generalized platitudes or bland "textbook" information. Aspirational encouragement of personalized goals is also more effective than scare tactics. Parents and healthcare providers should not anticipate instant success or have the naive expectation that just because they discourage risk behaviors, normative experimentation will not occur. However, they also should not be discouraged by slower progress, because it is the influence of appropriately unambiguous and caring messages over the longer term that has lasting salience and impact across all developmental stages.

Confidentiality and Its Limits

In the healthcare provider encounter, assurance and expectation of confidentiality balanced with appropriate communication with parental caregivers provide the context most conducive to effective prevention and intervention. Healthcare providers want to not only encourage open communication from youth that is undeterred by their concerns about the indiscriminate disclosure to parents and possible overpunitive responses but also engage families and empower their potential for positive influence. This balance shifts across developmental stages from childhood to young adulthood and will be explored below.

The building of trust and confidence from both adolescent and parent is an important theme, with each learning to trust that the healthcare provider takes their concerns seriously and will act judiciously and transparently to optimize their mutual desire for healthy outcomes. Parents should know that private communication between the youth and the healthcare provider is central to the effectiveness of the interaction, but they should rest assured they will be told about safety concerns and other concerns that are important to the adolescent's health and well-being. Adolescents should also know that their privacy will be protected, but that parents might be brought into the conversation when they need to be informed and included. Healthcare providers can discuss substance use with adolescents in the same way they discuss sexuality, violence, or mental health: "Our discussions are confidential, but we will need to include your family if I am seriously concerned for your health and safety." All states permit adolescents under 18 to receive diagnosis and treatment of sexually transmitted infections *without* parental knowledge and involvement, and most states allow minors to receive many or all contraception and family planning services. In more than half of states, minors can consent to diagnostic and treatment services for SUD without parents. Providers should know and understand the local laws concerning confidentiality.

Nevertheless, in the majority of situations, the ultimate goal should be promotion of family involvement despite not being legally required, because family engagement will usually lead to better outcomes. When an adolescent says, "Don't tell my mom about the pain pills," a productive response might be, "What should I say when your mother asks me about whether you've used pain pills?" Remind the patient that you

won't lie to parents and that the adolescent is likely to benefit from the help of their family members. When family does need to be involved, support the adolescent, but consider helping the adolescent take responsibility for telling their families. Once a SUD is diagnosed, patients and families should be informed that the most successful recovery plans are based on full and open communication between the patient, family, and treatment providers. Family and providers should also recognize that it is developmentally appropriate for adolescents to want privacy and that a balance must often be struck between what details certain family members know and when they learn them.

The limits to confidentiality are just as important as its protection. In particular, when a healthcare provider has reasonable concern about a health or safety risk, it is appropriate to disclose information and draw upon appropriate resources (such as parental caregivers). Disclosure is always best and most effective when done with consent and youth participation, and the extent and urgency with which a healthcare provider will proceed in the absence of such consent and/or participation should depend on clinical judgments regarding dangerousness, rather than legal constraints. These terms of engagement should be transparent and addressed up front.

Perception of Harm and Cultural Context

Substance use by youth is inversely correlated with youth perceptions of the harms they associate with use. Parental attitude and stance against substance use, which is protective, are also inversely correlated with parental perceptions of harm associated with youth use.

It is easier to attribute inherent risk to illegal substances than to highlight the risks of substances the government has legalized, since legalization of substances (such as marijuana) can give the impression that they are safe. In most states, tobacco is legal at age 18 and alcohol at 21, and in an increasing number of states, marijuana is becoming legal for recreational use. Similarly, medical use of substances (i.e., prescription medications and, in some states, cannabis) can be seen as an endorsement of safety or benefit and may reduce youth perceptions of harm. Such reductions in perceived harm have likely played a role in the increased use of prescription opioids among adolescents in the current opioid crisis and may contribute to the stable, high prevalence of marijuana use among adolescents. It is important for health providers and families to educate adolescents about the inherent risks of these legal substances and to normalize abstinence over use.

The current cultural context also tends to normalize substance use. Pop music and media stars routinely celebrate and even glorify intoxication. Luxury alcohol products are broadcast as icons of wealth and the good life. Such messages are also used in corporate branding strategies to which adolescents are especially susceptible. These have long been potent tools for commercial promotion of tobacco and alcohol and may be for cannabis in states that have legalized commercial sales. These are powerful forces for youth to resist and for concerned adults to counter-message.

Another major factor is social norming as a *misperception* by youth. Many adolescents overestimate the extent to which their peers use substances. This can be a misper-

ception of the magnitude and salience of pop culture messaging or a misperception viewed through the lens of a particular peer cohort if an adolescent's immediate peer group is indeed frequently using substances. In actuality, most US adolescents abstain from all substances; approximately 60% of eighth graders and 40% of tenth graders are lifetime abstainers, meaning that they have *never* used tobacco, alcohol, cannabis, or other illicit drugs. Furthermore, rates of use by youth have steadily declined over the past two decades, and rates of abstinence are steadily going up. Reframing these social norms to give a more protective (and more accurate) picture can be helpful.

Considerations for Children

Before talking to any child about drugs and alcohol, providers must first assess cognitive and development levels of maturity. Asking questions (e.g., "Do you know anyone who smokes cigarettes?" or "What is beer?") can help determine what information to provide. It is imperative to understand the family and social environment and what exposure the child has had to substance use. Younger children cannot readily appreciate nuance; the message "drugs/alcohol/cigarettes are bad" is confusing to a child whose parents smoke or drink. Providers need to discuss with parents how to manage this conflict in advance. For example, parents might state that they made a mistake or that they are trying to change and that substances are only for grown-ups. Children will ask questions when they are offered the opportunity, and answering their questions and clarifying any misinformation lay important groundwork for future discussion.

Introducing a discussion about substance use to younger children normalizes the topic and makes it a less sensitive subject at future encounters. Children will understand that substance use is a health issue providers will want to discuss, in the same way that providers ask about eating vegetables, getting sufficient sleep, or wearing a bicycle helmet. Parents of younger children should receive information about the prevalence of substance use in youth, risks of earlier age of onset of SUDs, and research on protective factors for the development of risk behaviors such as a SUD. The health discussion concerning substance use between the provider and child gives parents the opportunity to begin to establish family rules and expectations concerning drug and alcohol use. Children with baseline affective regulation difficulties, established or emerging psychiatric illness, or emotional/behavioral disturbances are especially vulnerable and should be targeted for high-priority monitoring and prevention interventions.

Considerations for Adolescents

Ideally, providers should have already had multiple discussions concerning substance use prior to adolescence, but in reality, that is often not the case. Instead, during middle school (approximately between ages 11 and 14 years) or at the onset of the teenage years, many providers will often announce that they need to speak to

the adolescent privately, escort the parent from the exam room, and then run through a list of questions which embarrasses the adolescent and elicits shrugs or silence instead of dialogue. As with younger children, the provider's first steps should be to assess developmental maturity and understand the adolescent's environment/exposure to SUD: a family history of SUD (emphasizing current patterns of use for parents and other family members, particularly older siblings) should be obtained or updated and questions asked about what, if any, discussions about substance use have occurred in the family. In addition, clinic practices concerning confidentiality should be reviewed with the youth and their family. Armed with knowledge about the family's substance use and attitudes toward use, the provider can then engage the adolescent to assess their knowledge, attitude, and experience with alcohol and drugs.

Before initiation or during early experimentation with substances, a particularly fruitful line of inquiry can explore peer use. Sample questions include "Do you know anyone who is using?", "Have you observed consequences in your peers who use?", and "How are you like or not like those peers?" For those who are reluctant to talk about their own personal experiences, peer-focused questions can also serve as an icebreaker or a way of saving face while speaking about themselves while referring to their peers' behaviors. Temptation and curiosity should be acknowledged. Abstinence should be highlighted, framed as an active choice, normalized, and praised as an achievement.

For those who have started using substances and are at risk for progression, it can be helpful to start with an open exploration of the adolescents' perceptions of pros and cons of substance use. It is critical to foster honesty about using behaviors and the potential appeal of intoxication. Many adolescents will minimize consequences and risk, stating, for example, "It's no big deal," "I'm not using that much," or "I've never gotten in trouble." Some ways to respond might include: "I'm glad you haven't been in trouble yet, but do you know others who have gotten in trouble? What's different about them or their use?" This helps to frame and define the adolescent's picture of what distinguishes problematic use from non-problematic use.

Another highly effective response to an adolescent might be, "You don't think your use is a problem now, but in your eyes, what would be evidence that it had become a problem in the future?" This helps establish future lines of reference that they consider problematic to cross and can serve as an encapsulation of their own personalized warning message that the provider can reflect back on with the adolescent at a future conversation. Similarly, the response, "You don't think it's a problem, but do you know why I as your healthcare provider or your parents might think it's a problem even if you don't agree with us?", requires adolescents to articulate a rationale for concern, even if they don't fully endorse it, and can help tilt ambivalence in the right direction. It also encourages the exercise of making observations about one's self, from an external perspective, which is an appropriate, emerging, and essential developmental task.

Language that fosters ongoing dialogue rather than shutting down communication through one-sided disapproval is essential, such as "we can agree to disagree, but I am really happy that you are so willing to be honest and thoughtful with me in

Table 9.1 Summary of some motivational interviewing-style prevention language

What are the pros and cons of substance use for you?
Do you know other people who have been in trouble due to their substance use?
Do you know why I or your parents might think your substance use is a problem?
What would be evidence in your view that it's a problem?
If you can stop using substances anytime, would you be willing to see what it's like?
Let's schedule a time for you to come back and see how it's going

your exploration of this issue…." Most important is the promotion of longitudinal engagement on the issue of substance use: "Let's schedule a time for you to come back and see how it's going. You can give me feedback, and tell me more about how you're handling all this…" (Table 9.1).

Considerations for Young Adults

The 18th birthday is often considered the age when legally the adolescent is now an adult. Alcohol is still illegal in the USA under the age of 21, although it remains readily accessible. As of this writing, over half of US states have medicalized cannabis with varying age restrictions, and nine states (plus Washington, D.C.) have legalized recreational cannabis use over age 21. Some young adults are living at home, at college, or on their own, but all young adults share a biologic reality: brain development is not complete until approximately age 25, and substances can continue to impact brain development even though they are legally adults.

Late adolescence and young adulthood are the stage during which healthcare providers are most likely to identify more severe cases of problematic substance use. Those with problematic use tend to increasingly segregate into substance-using peer groups. This reinforces the misperception of deviant social norming—that is, such young adults may not only believe that "everyone is doing it" but also that their use is not actually "that bad" compared to many of their peers.

With exposure to substance-using peers, young adults may experience a downward drift in their achievements, ambitions, expectations, and opportunities. This in turn also contributes to deviant social norms in a dangerous positive feedback loop. Those with progressive patterns of habitual use tend to redefine their perceptions and expectations of life through the lens of a "new normal." Many young adults incorporate substance use into routine but maladaptive coping strategies and stress responses. In this context, clarification of personal goals and inventory of achievements and disappointments can be helpful. The phrase "How's that working for you?" may be a way of encouraging self-reflection. Poor self-perception of loss of control or impairment tends to be the rule, not the exception, with many young adults believing that they could quit using substances at any time. Whereas 12-step

approaches emphasize embracing loss of control and surrender, this concept may not resonate with young adults due to their developmental stage as they often perceive themselves as invincible. Sometimes an approach that examines self-confidence and its limitations may be helpful. For example, a provider might ask, "If you can stop anytime, would you be willing to give it a try, even if only temporarily, to see what it's like, or to see whether it really is so easy?" Again, *longitudinal* engagement is key. The more advanced the substance use, the more the process is a proverbial marathon and not a sprint.

Parents and healthcare providers should continue to provide information and guidance on alcohol and drug use, emphasizing both the immediate risks of use and the associated health behavior risks. Because they are of the age of majority, by law young adults over 18 are entitled to full confidentiality in their healthcare. However, if problem use or addiction is identified, it is crucial for families to remain involved, and the young adult should be encouraged to provide consent for release of information to parents. At some threshold of dangerousness, the benefits of urgent disclosure, if necessary, outweigh the risks of breaching confidentiality. One way of signaling concern is to state to parents in front of the young adult that consent has been withheld and ask the young adult to address this more directly. All too often families are boxed out of the process, even when they try to be involved. But respecting the confidentiality of young adults and including families are usually not incompatible with one another, when approached thoughtfully. While there may be natural tension in families over issues of independence, control, trust, autonomy, etc., these can usually be successfully addressed and negotiated.

Considerations for Parents

Addressing substance misuse in the family is crucial, both for preventing the development of a SUD and when developing a treatment plan for recovery. Initially, providers should ask parents about substance use as part of the intake family history ("Any asthma in the family? Any drug or alcohol use? Is anyone in recovery?"). This can be the first step in normalizing a discussion about SUDs. This part of the family history should be routinely updated, asking particularly about older siblings or other family members. Providers should speak privately with parents if they have concerns about parental substance use and need to know available community treatment resources available to parents. For a youth with an identified SUD, recovery is much harder if there are still opioids in the medicine cabinet or family members using drugs or alcohol in the house. This can be an optimal time to identify and refer other family members for assistance with their substance use by discussing that their ongoing use could jeopardize their child's recovery/health. Sometimes a "universal precaution" approach can be helpful: "I know some families use substances recreationally or socially without any problem, and I'm not saying anything about your family in particular. But children/adolescents are mimics and will do what you ***do*** more than what you ***say***, so we often recommend that when we're trying to

prevent use or progression it's better to declare a substance-free household. I know it may be a burden, but it's only temporary and sends a powerful message…."

Providers need to help parents understand that substance use is not black and white, good versus bad. "Good kids" are not immune to "bad behaviors," and while only a minority of youth will develop problem use or an SUD, it is very common for youth to experiment with drugs and alcohol. By grade 12, 16% of high school seniors have misused a prescription medication, almost 50% have used an illicit substance, and almost two-thirds have drunk alcohol. Binge drinking (five or more drinks in a row) in the past 2 weeks was reported by almost 20% of high school seniors, and one of five high school sophomores has been drunk at least once in the past year [6].

Parents should communicate with their child's school and their child's friends' families to establish a shared position on alcohol and drug use, e.g., no drugs or alcohol in the house/no drugs and alcohol at parties. However, many parents think "since adolescents are going to do it anyways, I should have them at my house where I can supervise and teach them to do it responsibly." Supervision may mean collecting car keys and/or insisting on sleepovers or maybe a "beer not liquor, and no other drugs" rule. These parents might compare this approach to safe sex—making contraception and condoms available to youth although they hope they will remain abstinent. However, allowing alcohol and drug use is different: taking away car keys may prevent motor vehicle crashes, but there are additional enormous risks associated with alcohol use. Just because no one can drive does not mean there won't be fighting, unwanted sexual encounters/assault (often without condoms), and other drug use. Acquiescence to substance use as inevitable is an endorsement of use and sends the wrong message. Adolescents and young adults also tend to engage in heavy binge drinking resulting in intoxication, vomiting, alcohol poisoning, and even death. About 100 youth die annually in the USA from alcohol poisoning [7]. Along with the risks for adolescents, the parents are taking risks. In every state, it is illegal to provide alcohol to minors, and many states are enacting and enforcing "social hosting" laws with criminal penalties on the adult hosts of the party. Most parents are surprised at the well-substantiated facts about early initiation predicting poor prognosis, even when that initiation happens "at home under supervision."

Summary

Consistency and communication are the cornerstones for addressing substance use with children, adolescents, and young adults. Healthcare providers should make identifying and addressing substance use a priority, using an approach of longitudinal engagement and concern for health and function. Keep the message simple, straightforward, and developmentally appropriate. It is important for families to openly acknowledge drug and alcohol use within their own families and to try and to model behaviors they hope to see in their children. While many parents may take more of a resigned approach ("Of course it's going to happen, kids experiment, I did it

when I was young."), it is important for providers to educate parents that delaying the onset of use is extremely impactful in decreasing the risk for developing substance use disorders and addiction.

Take-Home Points

- Substance use and substance use disorders (SUDs) are developmental problems of pediatric onset.
- Earlier initiation of substance use increases the likelihood of progression to a SUD, severity of the SUD, persistence into adulthood, and poorer prognosis. Earlier intervention predicts an earlier and more favorable response and better overall prognosis.
- Screening for substance use, case identification, referral, and treatment can all prevent progression to more advanced stages of substance use.
- Core elements of prevention across childhood, adolescence, and young adulthood include fostering open communication, promoting ongoing engagement, giving personalized feedback, understanding confidentiality and its limitations, and providing guidance for parents and caregivers around attitudes, modeling, monitoring, and supervision.

References

1. Center for Behavioral Health Statistics and Quality. Behavioral health trends in the United States: results from the 2014 national survey on drug use and health. 2015; (HHS Publication No. SMA 15-4927, NSDUH Series H-50). https://www.samhsa.gov/data/sites/default/files/NSDUH-FRR1-2014/NSDUH-FRR1-2014.pdf. Accessed 7 Aug 2018.
2. The National Center on Addiction and Substance Abuse (CASA) at Columbia University. National survey of American attitudes on substance abuse XV: teens and parents. 2010. https://files.eric.ed.gov/fulltext/ED511700.pdf. Accessed 7 Aug 2018.
3. The National Center on Addiction and Substance Abuse (CASA) at Columbia University. National survey of American attitudes on substance abuse XVI: teens and parents. 2011. https://www.centeronaddiction.org/download/file/fid/1282. Accessed 7 Aug 2018.
4. Dennis ML, Scott CK, Funk R, Foss MA. The duration and correlates of addiction and treatment careers. J Subst Abus Treat. 2005;28(Supplement 1):S51–62.
5. Substance Abuse and Mental Health Services Administration. Results from the 2010 national survey on drug use and health: summary of national findings. 2011; NSDUH series H-41, HHS publication no. (SMA) 11-4658. https://www.samhsa.gov/data/sites/default/files/NSDUHNationalFindingsResults2010-web/2k10ResultsRev/NSDUHresultsRev2010.pdf. Accessed 7 Aug 2018.
6. Johnston LD, O'Malley PM, Miech RA, Bachman JG, Schulenberg JE. Monitoring the future national survey results on drug use, 1975–2016: overview, key findings on adolescent drug use. Ann Arbor: Institute for Social Research/The University of Michigan; 2017.
7. Centers for Disease Control and Prevention. Morbidity and Mortality Weekly Report. Vital signs: alcohol poisoning deaths—United States, 2010–2012. https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6353a2.htm. Accessed 7 Aug 2018.

Chapter 10
Role of Families, Schools, and Communities in Treatment and Recovery: From First Responders to Sustained Support

David G. Stewart, Anita Chu, and Nancy Rappaport

Family Therapy to Treat Substance Use Disorders

Family therapy has long been recognized as an important adjunct to substance use disorder treatment, with recognition that family systems can perpetuate patterns of interactions and behavior that contribute to continued substance use [1]. An evidence base has developed for family-based treatments for adolescents with substance use disorders. These treatments vary in approach, cost, and availability but share an emphasis on the interactional and systemic nature of substance use disorders and recovery. Table 10.1 summarizes some of the most well-researched interventions, their target clinical populations, and methods of dissemination.

This list comprises a continuum of widely disseminated evidence-based practices, each tested in randomized controlled trials.

Community Reinforcement and Family Training (CRAFT) focuses on engaging concerned family members and teaches them to respond to the adolescent who is using substances in systematic ways that increase the likelihood of treatment engagement. CRAFT focuses on teaching families effective non-confrontational strategies to help an adolescent with substance use engage in treatment. Family members learn to build motivation by understanding triggers for substance use, motivational and behavioral strategies (functional analysis), contingency management strategies, and practical problem-solving skills in order to become agents of change. Clinical trials have demonstrated the CRAFT approach to be significantly more effective at producing treatment entry (70% of family members with substance use disorder entered treatment within a year) and completion compared to

D. G. Stewart (✉) · N. Rappaport
Department of Psychiatry, Cambridge Health Alliance, Harvard Medical School, Cambridge, MA, USA
e-mail: dstewart@cha.harvard.edu

A. Chu
Child Guidance Center of Southern Connecticut, Stamford, CT, USA

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Table 10.1 Family-based interventions

Treatment	Clinical populations	Dissemination/access
Community Reinforcement and Family Training (CRAFT) [2]	Concerned significant others of substance user	Clinician training and self-help family manual
Multidimensional Family Therapy [3]	Family of adolescent substance user in treatment	Clinician training, CYT manual
Brief Strategic Family Therapy [4]	Families of substance-using youth; often juvenile justice involved	Agency or clinician training
Functional Family Therapy [5]	Families of substance-using youth; often juvenile justice involved	Agency training (mental health, child welfare and parole/probation systems)
Multisystemic Therapy [6]	Families of substance-using youth; often juvenile justice involved	Agency or system training

the confrontation-based "interventions" (less than 20% entered treatment) [7]. A self-help book version of CRAFT is available for family members and is a good tool for clinicians working with family members when the identified substance-using adolescent is reluctant to engage in treatment [8].

Multidimensional Family Therapy (MDFT) is an approach that is available in manual form through the Cannabis Youth Treatment series disseminated by the federal Substance Abuse and Mental Health Services Administration (SAMHSA). MDFT is guided by the principle that substance use in adolescents is multidimensional and that developing working relationships among individuals and systems is key to change. The treatment involves three stages: (1) goal setting and establishing an alliance among the adolescent, family, and school; (2) change strategies, including coping, communication, and emotional regulation; and (3) relapse prevention, including ongoing problem-solving and planning for sustained change. MDFT has demonstrated success in retaining adolescents and families in treatment (88% still in treatment at 6 months vs. 24% in residential treatment) and has proven effective with diverse racial and ethnic populations [9, 10]. Clinician training is available in this modality and is appropriate for individual clinicians who work with adolescents and families with substance use concerns.

The final three interventions referenced in the table are agency-level interventions designed for youth in juvenile justice or other intensive adolescent serving systems. Clinicians who work with adolescents and families should be familiar with Multisystemic Therapy, Functional Family Therapy, and Brief Strategic Family Therapy as evidence-based programs that each demonstrates significant positive outcomes for substance-using adolescents. One of the hallmarks of these programs is the emphasis on engaging families in treatment. MST, for example, is not an office-based practice and engages families in home and community settings [11].

Brief Strategic Family Therapy (BSFT) is short term (12 sessions), structured, and problem focused with a goal to increase family functioning including positive parenting, parental monitoring, effective parental discipline, and absence of family

Table 10.2 Goals and strategies of family-based interventions

Common goals	Common techniques for family interventions	
Reduce substance use	Identify high-risk situations, emotional and behavioral triggers to substance use	Develop specific strategies to cope with high-risk situations and triggers
Clearly and effectively communicate	Teach strategies to communicate needs and requests without apology or aggression	Teach reflective listening, validation
Support positive change	Identify and engage in shared positive activities	Provide reinforcement for abstinence, positive behavior change (school, work, etc.)
Improve bond/ emotional connection	Identify and schedule family members both as a group and in dyads to spend time together (5 min to several hours)	Engage discussion of positive affirmations and appreciation for each other and review of positive events and examples of good coping in family members

conflict. BSFT has a strong cultural engagement component and is developed to leverage the strengths in family systems. BSFT assesses and diagnoses patterns of triangulation and miscommunication in families by using culturally specific techniques to understand patterns of alliance, developmental stage, problem-solving styles, and social and cultural conditions affecting the family. BSFT has demonstrated better substance use outcomes compared to standard group therapy among African-American and Hispanic adolescents [12]. The intervention is both flexible and adaptable to individual family differences, as well as broader cultural norms. Clinical trials show that the positive outcomes were caused by improved family communication among Hispanic participants and decreased association with peers exhibiting problem behaviors for African-American teens.

These family and systemic programs may be particularly appropriate when adolescents entering substance use treatment are simultaneously involved in juvenile justice or child welfare systems. Availability of any or all of these programs will be variable from community to community. In jurisdictions without any of these more intensive modalities, clinicians can place community agencies, juvenile courts, and even police departments in touch with these program developers to investigate the possibility of developing a local implementation site. Table 10.2 summarizes some of the common goals and strategies of family-based interventions for clinicians and agencies to consider.

Family Supports for Substance Use Disorder Treatment and Emerging Recovery

When a family member has a substance use disorder, there has likely been collateral damage to relationships that, even after sobriety, takes considerable effort to heal. In addition to referrals to family-based substance use disorder treatment, many

families will benefit from referral to family therapy to treat ongoing and co-occurring problems. Barkley and Robbins' Defiant Teens program [13] is an approach to limit setting, negotiating, and reinforcing desired behavior and is available in a clinician-guided manual or a self-help manual for parents. Trauma-focused cognitive behavioral interventions are widely disseminated and have strong parent-child components for adolescents who have experienced trauma. Dialectical Behavior Therapy programs are available in individual and skills group formats, many with parent components that can help teens and families work on emotional regulation, distress tolerance, mindfulness, and interpersonal effectiveness [14]. When families are reluctant or unable to engage in family therapy, clinicians may find themselves providing guidance about setting consistent limits, responding to ongoing substance use, and rewarding non-using behavior.

While testing for substance use via urine drug screens may seem to be the logical solution to monitoring adolescent drug activity, the most effective monitoring parents can do is to communicate clear expectations to their adolescent, monitor their activities (school, work, and recreation), and influence their peer involvement. These monitoring activities such as asking questions, verifying information, and checking in may engender some conflict but can also be discussed with the help of the clinician. Table 10.3 provides an example of a communication and monitoring plan that can be negotiated with the assistance of a clinician.

Table 10.3 Communication and monitoring strategies

Domain	What is expected	What we need to know	How to make it happen (*Communication is key*)
Treatment	Attend as scheduled	Number of sessions attended and evidence of engagement in treatment	Keep a calendar of the appointments and *check in verbally about them* Teen and parent sign limited release of information *Therapist updates* on attendance and global rating of engagement
Peers	Parents know who the adolescent spends time with in person and online	Who the adolescent is with, what they are doing, where they will be, when they will be there	*Daily check in* about activity Establish curfew Agreement to *send and respond to texts* No post hoc excuses for changing plans or being late; if things happen there should be *live updates* (purchase pocket mobile phone charger)
School	Daily attendance and passing grades	Attendance every day at all classes; work completed and turned in	*Check-in verbally* Online attendance, assignment, and grade trackers *Regular call* to guidance counselor

(continued)

Table 10.3 (continued)

Domain	What is expected	What we need to know	How to make it happen (*Communication is key*)
Work	Part time that does not interfere with school or treatment	Schedule and hours, pay amount, spending/saving amounts	Keep a calendar of work schedule View paystubs to ascertain hours worked and earnings Consider assisting with money management and cash to prevent drug/alcohol purchases; consider use of gift cards instead of using cash to fund purchases
Recreation	Engage in prosocial activities; expect some limits on gaming/screen/chat time	Enrollment or informal participation in out-of-home organized activities with other people (sports, clubs, arts, volunteer, religious)	Identify activities, *ask school* for ideas Support participation Financially (if able) Attend events *Talk about activities* Control access to Wi-Fi or data at *agreed limits*
Substance use	Abstinence	Success in above domains, reports from treatment providers, adolescent self-report, objective measures (urine drug screen administered and interpreted at the clinic)	Periodic *family meetings* with or without treatment team to review progress across domains (see Table 10.4 for evaluation strategies) *Adolescent reports* use, near misses, urges to therapist or parent *Connect* incentives to negative drug screens if used

School Supports for Substance Use Disorder Treatment and Emerging Recovery

Schools often provide the most impactful social context for adolescents outside of the family system. Substance use can impair school attendance, achievement, and behavioral function for individual adolescents. However, schools also provide a context for first responses to substance use and ongoing support for treatment and recovery. Prevention programs are reviewed elsewhere (see Chap. 8), and it is important to note that comprehensive prevention programs like Botvin's Life Skills Training [15] offer interventions that are still applicable to students who have progressed to substance use and/or entered recovery.

Even in the complete absence of school-based substance use prevention or intervention services, student assistance programs that provide needed psychosocial intervention to aid in learning and education goals are appropriate for adolescents with identified substance use disorders. The etiology of problematic adolescent sub-

stance use is likely to include underlying learning; behavioral and emotional difficulties that all schools are prepared to manage through the IEP, Section 504; and/or student assistance processes. Not only can these mechanisms be used to help with primary learning, emotional, and behavioral disorders, but they can also be implemented (particularly as Section 504 accommodations) in direct response to substance use disorders and the resultant secondary emotional and behavioral difficulties [16].

Like family therapy interventions, the continuum of school responses to substance use range from policies and procedures meant to protect adolescents to direct interventions to treat substance use and support recovery. The continuum of school interventions can be conceptualized by the level of involvement of school personnel in the treatment delivery. At the lowest level of involvement, the school may provide a screening and referral service to outside providers. While many of these providers may be frequent recipients of referrals, their role is solely to provide services to the adolescent and family with ancillary contact with the school as clinically determined. In these cases, there is unlikely to be a regular information exchange between the school and provider outside of the referral.

Next in the continuum in terms of involvement are providers that are present at the school, either through contracted services with community agencies or collocated teen health services. At this level, the referral process is more efficacious at placing students into dedicated treatment slots, and the school gets more immediate feedback as to the outcome of the referral. Information exchange is more frequent and bidirectional as the treatment provider will directly access information about attendance and school behavior when on site [17]. This higher level of access requires that the treatment provider take care to seek appropriate consent for the higher level of disclosure and to take steps to protect the adolescent's privacy when this consent is withheld.

The highest level of involvement and care coordination happens when school personnel deliver direct substance use treatment in the form of student assistance programs that provide group and individual support to the adolescent by trained school personnel. These personnel can include appropriately certified teachers, counselors, healthcare providers, or administrators. At the highest end of this continuum are recovery high schools, a still rare but increasingly popular option often embedded within comprehensive high schools [18]. Recovery schools include public, private, charter, and alternative schools that are organized to exclusively serve adolescents in recovery. The educational and therapeutic missions are completely merged, and the programs provide a therapeutic community.

The principals and practices of evidence-based substance use disorder treatment are critical to the success anywhere on this continuum. The practices of screening, assessment, and intervention identified in this book should be employed in agencies that partner with schools to provide services. A school system is in a particularly strong position to incentivize adoption of these practices by their treatment partners.

In addition to their role in the continuum of treatment, schools function as first responders to adolescent substance use. Effective systems to facilitate referrals to screening, assessment, and treatment should be in place at all schools and known to

all personnel. The American Academy of Pediatrics [19], civil liberty groups, and others do not recommend random screening for drug use among students; even still, school personnel play a critical role in monitoring for substance use among students. Evidence of problematic substance use may include absenteeism, paraphernalia, peers expressing concern, and suspected intoxication. In studies of school-based substance use intervention programs, school personnel referring students to substance use intervention based on observational screening were highly accurate in identifying problem users with very few false positives [17]. School-wide screening programs using screening, brief intervention, and referral to treatment (SBIRT) procedures (described for office-based settings in Chap. 3) can also be implemented in schools and periodically be used to identify students who may not be observably using substances.

Any school discipline for substance use should be accompanied by a referral for interview or questionnaire-based screening by a trained school nurse or guidance counselor and follow-up when indicated by a primary care or specialty provider. Discipline events often have therapeutic value in motivating a student and family for intervention. To the extent that school and district policies allow for substance use assessment and/or treatment as an alternative or concurrent response to suspension or detention, they should be considered. Some school districts have implemented extracurricular rules that avoid expulsion from teams and activities for substance use but instead encourage practice but prohibit playing or performing until the student has engaged in an intervention program [20]. The goal is to maintain school engagement while protecting the adolescent and his or her peers from ongoing substance use behaviors.

Screening for substance use may also be indicated when other attendance, behavior, or emotional problems are observed. School personnel should receive routine in-service training in substances of abuse, signs of intoxication, withdrawal, and overdose. Additionally, school nurses should carry naloxone to respond to opiate overdoses by a student or adult in the school building [21].

Overcoming Barriers to Implementing School Supports

Despite the universal need and clear call to action for schools to respond to substance use, barriers to having a comprehensive array of prevention, intervention, and recovery support services include time, money, overburdened staff, and lack of expertise among educators and healthcare providers. Fortunately, many dedicated educators are incredibly skilled at finding creative solutions to overcome these barriers. Some of these solutions include collaborative partnerships with community resources. Agencies and practitioners that treat adolescent substance use disorders can help schools create a referral network and suggest referral procedures both for low and high urgency referral questions.

Low urgency referrals may include students who are suspected of substance use and exhibit a deterioration in school functioning but do not appear to be using or

intoxicated at school. Higher urgency referrals include students who are disciplined for substance use infractions such as possession or intoxication at school or school events. The agencies can provide guidance about who to contact and how to indicate the priority of the referral. In conjunction with school nurses, these professionals can also identify situations when emergency intervention is needed. Additional support may come from professionals at local colleges and universities who are qualified to provide in-service training to staff on adolescent substance use. These low-cost activities can significantly upgrade the capacity of a school to respond to substance use effectively.

Community Supports for Substance Use Disorder Treatment and Emerging Recovery

One of the most widespread community responses to substance use are self-help groups hosted in public spaces throughout a community. Self-help groups can provide an important service in recovery and recovery support through 12-step, spiritual, cognitive-behavioral, and other recovery modalities [22]. By definition, self-help groups do not employ professional therapists and are not designed to respond to co-occurring mental health or medical conditions. Self-help is also available for family members of individuals in recovery or actively misusing substances through organizations such as Al-anon and Alateen. Clinicians and families who recommend an adolescent attend a self-help group, or other sober community activities (recreation groups, coffee houses) should monitor the adolescent's participation and, when possible, pre-screen the group to determine if the attendees and content are age appropriate for the adolescent. It may be appropriate, for example, to attend a 12-step meeting with an adolescent or at least drop off and pick them up from the activity.

Several local, state, and federal agencies sponsor substance use awareness programs that involve informational sessions at schools, clinics, and community agencies [23]. Clinicians may also be in a good position to inform their patients about pill take-back programs sponsored by local law enforcement or public health agencies and help to reduce the availability of prescription drugs for misuse. Community agencies should also be encouraged to provide access to naloxone as broadly as possible including individuals who are concerned about overdoses among friends or family. Many states have passed legislation that limits the liability of schools and agencies providing naloxone. Some schools and agencies have also received free or low-cost supplies of the life-saving drug from pharmaceutical companies and/or foundations [24].

Substance use problems develop across time, affecting multiple domains and a complex intersection of biopsychosocial functioning. Once an adolescent is flagged as struggling with substance use, the concern is seemingly continuous as even successful entry to treatment puts them on a path that may involve slips and relapses. Success is therefore measured on multiple levels and includes not only dichotomies of "using or not" and "in-treatment or not" but instead a complex intersection. Table 10.4 illustrates how systems working together can judge progress.

Table 10.4 Recommendations for strengthening recovery

	Attending treatment, expected activities and complying with house rules	Not attending, meeting expectations or complying with rules
Using substances	***Caution*** • Plan may be working • Continue supporting treatment engagement • Analyze slips and relapses • Make a plan for new or improved coping strategies	***Warning!*** • Plan is not working • Increase monitoring • Implement motivational interviewing • Incentivize treatment engagement (e.g., vouchers, gift cards, screen time)
Abstaining	***Keep Going!*** • Plan is working • Continue supporting treatment engagement • Analyze successful coping and validate successes • Strengthen positive activities	***Caution*** • Plan is not being implemented, but something is working; ask, is it sustainable? • Incentivize treatment engagement • Analyze successful coping and validate successes • Strengthen positive activities

Take-Home Points

- Sustained change in adolescent substance use comes from understanding and intervening across the social ecology of the adolescent.
- Even a motivated and engaged adolescent working hard in individual substance use treatment has to recover in the context of family, friends, school, and community.
- Although the goal of effective and sensitive engagement of the family of substance-using adolescents can appear to be overwhelming, all evidence-based programs report positive outcome data.
- Healing and support of an adolescent's family is the most direct and robust path to adolescent recovery from substance use disorders.

References

1. Hogue A, Liddle HA. Family-based treatment for adolescent substance abuse: controlled trials and new horizons in services research. J Fam Ther. 2009;31(2):126–54.
2. Smith JE, Meyers RJ. Motivating substance abusers to enter treatment: working with family members. New York: Guilford Press; 2004.
3. Liddle HA. Multidimensional Family Therapy for adolescent cannabis users. Cannabis Youth Treatment (CYT) Series (Volume 5). Rockville: Center for Substance Abuse Treatment, Substance Abuse and Mental Health Services Administration; 2002.

4. Szapocznik J, Williams RA. Brief strategic family therapy: twenty-five years of interplay among theory, research and practice in adolescent behavior problems and drug abuse. Clin Child Fam Psychol Rev. 2000;3(2):117–34.
5. Alexander JF, Waldron HB, Robbins MS, Neeb AA. Functional family therapy for adolescent behavior problems. Washington, DC: American Psychological Association; 2013.
6. Henggeler SW, Clingempeel WG, Brondino MJ, Pickrel SG. Four-year follow-up of multisystemic therapy with substance-abusing and substance-dependent juvenile offenders. J Am Acad Child Adolesc Psychiatry. 2002;41(7):868–74.
7. Miller WR, Meyers RJ, Tonigan J. Engaging the unmotivated in treatment for alcohol problems: a comparison of three strategies for intervention through family members. J Consult Clin Psychol. 1999;67(5):688–97.
8. Meyers RJ, Wolfe BL. Get your loved one sober: alternatives to nagging, pleading, and threatening. Center City: Hazelden; 2004.
9. Liddle HA, Dakof GA. A randomized controlled trial of intensive outpatient, family-based therapy vs. residential drug treatment for co-morbid adolescent drug abusers. Drug Alcohol Depend. 2002;66:S2–S202, S103.
10. Greenbaum PE, Wang W, Hall K, et al. Gender and ethnicity as moderators: integrative data analysis of multidimensional family therapy randomized clinical trials. J Fam Psychol. 2015;29(6):919–30.
11. Henggeler SW, Schaeffer CM. Multisystemic Therapy®: clinical overview, outcomes, and implementation research. Fam Proc. 2016;55:514–28.
12. Santisteban DA, Coatsworth JD, Perez-Vidal A, Mitrani V, Jean-Gilles M, Szapocznik J. Brief structural/strategic family therapy with African American and Hispanic high-risk youth. J Community Psychol. 1997;25(5):453–71.
13. Barkley RA, Robin AL, Benton CM. Your defiant teen: 10 steps to resolve conflict and rebuild your relationship. New York: Guilford; 2008.
14. Trupin EJ, Kerns SEU, Walker SC, DeRobertis MT, Stewart DG. Family integrated transitions: a promising program for juvenile offenders with co-occurring disorders. J Child Adolesc Subst Abuse. 2011;20(5):421–36.
15. Botvin GJ, Griffin KW. Life skills training as a primary revention approach for adolescent drug abuse and other problem behaviors. Int J Emerg Ment Health. 2002;4(1):41–8.
16. Haggard LK. Reasonable accommodation of individuals with mental disabilities and psychoactive substance use disorders under Title I of the Americans with Disabilities Act. Wash U J Urb Contemp L. 1993;43:343.
17. Stewart DG, Siebert E, Arlt VK, Moise-Campbell C, Lehinger E. READY or not: findings from a school-based mi intervention for adolescent substance use. J Subst Abus Treat. 2016;71:23–9.
18. Finch AJ, Tanner-Smith E, Hennessy E, Moberg DP. Recovery high schools: Effect of schools supporting recovery from substance use disorders. Am J Drug Alcohol Abuse. 2018;44(2):175–84.
19. Levy S, Siqueira LM, Committee on Substance Abuse, Ammerman SD, Gonzalez PK, Ryan SA, Siqueira LM, Smith VC. Testing for drugs of abuse in children and adolescents. Pediatrics. 2014;133(6):e1798–807.
20. Evans-Whipp T, Beyers JM, Lloyd S, Lafazia AN, Toumbourou JW, Arthur MW, et al. A review of school drug policies and their impact on youth substance use. Health Promot Int. 2004;19(2):227–34.
21. National Association of School Nurses. Naloxone use in the school setting: the role of the school nurse (Position Statement). 2015. https://www.nasn.org/advocacy/professional-practice-documents/position-statements/ps-naloxone. Accessed 10 Aug 2018.
22. Kelly JF, Myers MG, Brown SA. A multivariate process model of adolescent 12-step attendance and substance use outcome following inpatient treatment. Psychol Addict Behav. 2000;14(4):376–89.

23. SAMHSA, Office of Applied Studies, 2008, as cited in Community Anti-Drug Coalitions of America (CADCA). Research support for comprehensive community interventions to reduce youth alcohol, tobacco and drug use and abuse. Research and Evaluation White Paper Series, 2010, 1.
24. Burris S, Beletsky L, Castagna CA, Coyle C, Crowe C, McLaughlin JM. Stopping an invisible epidemic: legal issues in the provision of naloxone to prevent opioid overdose. Drexel L Rev. 2009;1:273–340.

Chapter 11
Special Populations and Topics in Adolescent Substance Use

Brittany L. Carney and Sarah M. Bagley

Health Maintenance and Prevention

Certain preventive services should be offered and available to all youth whether they use substances or not. These include vaccinations, routine screening for human immunodeficiency virus (HIV) and other sexually transmitted infections (STIs), and counseling and access to contraception. Other health promotion screening can be found in Table 11.1. The most recent vaccine schedules (which are typically updated annually) for adolescents can be found from the Centers for Disease Control and Prevention (CDC), US Preventive Services Task Force, or the American Academy of Pediatrics (AAP).

As described in Chap. 3, the AAP recommends universal screening of adolescents aged 12 and older for substance use using a validated tool [1]. In addition to routine preventive services, youth who use substances have unique healthcare needs that can be addressed in primary care. In the following chapter, we will discuss special considerations that should be given to the following populations: youth who inject substances; pregnant youth; lesbian, gay, bisexual, transgender, queer, or questioning (LGBTQ) youth; and homeless youth. Primary care providers are uniquely positioned to closely monitor these needs over time.

B. L. Carney
Graduate School of Nursing, University of Massachusetts Medical School, University of Massachusetts Worcester, Worcester, MA, USA

S. M. Bagley (✉)
Section of General Internal Medicine, Department of Medicine, Boston University School of Medicine/Boston Medical Center, Boston, MA, USA

Division of General Pediatrics, Department of Pediatrics, Boston University School of Medicine/Boston Medical Center, Boston, MA, USA
e-mail: sarah.bagley@bmc.org

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Table 11.1 Health promotion screening

HIV[a]	At least once for all adolescents Annually or more often for youth who inject drugs or are sexually active
Gonorrhea/ chlamydia[a]	Annually for all sexually active adolescents
Trichomonas[a]	Girls and women who report vaginal discharge Girls or women who receive care where this may be more frequent (e.g., institutions, STI clinics), have multiple sexual partners, illicit substance use, or a history of a previous STI
Syphilis[a]	Consider annually for all sexually active adolescents who use substances Consider more frequent testing for men who have sex with men
Hepatitis B[a] HBsAg + HBsAb +/− HBcAg	Pregnant girls or women
Hepatitis C virus antibody and AST/ALT levels	Youth who inject drugs or have injected drugs, have elevated alanine aminotransferase (ALT) levels for a period of time, or are HIV positive
Tuberculosis	Youth who have had recent contact with individual with TB or live in institutions (e.g., shelters, jail)
Urine pregnancy test	For girls or women who may be pregnant, some programs may choose to screen at all visits
Pre-exposure prophylaxis (PrEP)[a]	Approved for adolescents under 18 and young adults over 18 who are HIV-negative but have a high risk of getting HIV, by: High-risk sexual activity (e.g., not using barrier protection, commercial sex work) Injection drug use (e.g., sharing needles/equipment or being in treatment for injection drug use during the past 6 months)
Cervical cancer[a]	Pap test every 3 years for women 21 and older For HIV-positive women, at least 1 year within diagnosis or sexual activity and repeated again at 6 months
Alcohol, tobacco, and other drugs[b]	Standardized screening (e.g., CRAFFT 2.1 or S2BI) annually for individuals aged 11 and older
Depression[b]	Standardized screening (e.g., PHQ-9) annually for individuals 12 and older

[a]These recommendations were adapted from the CDC current screening recommendations. The most updated guidelines can be found here: https://www.cdc.gov/std/tg2015/screening-recommendations.htm

[b]These guidelines were incorporated from the AAP's *Recommendations for Preventive Pediatric Care* Guidelines. Found here: https://www.aap.org/en-us/documents/periodicity_schedule.pdf

Youth Who Inject Drugs

Individuals who inject drugs are at an increased risk for a variety of medical complications including hepatitis C virus (HCV), HIV, fatal and nonfatal overdose, and injection-related complications such as endocarditis [2]. According to the 2015 Youth Risk Behavior Survey, 1.8% of youth (grades 9–12) injected an illegal substance [3], putting them at higher risk of developing these complications. Once a youth has disclosed injection use, it is critical to help promote and maintain his or

her safety, including both from immediate harms (e.g., overdose) and longer-term consequences (e.g., HIV, HCV).

In approximately half of US states, youth under 18 are able to consent to substance use disorder treatment without parental or other guardian involvement. However, this varies by state and providers should be familiar with the regulations within their scope of practice. In addition to consent, confidentiality is an important consideration. Federal regulations protect adolescent's rights to confidential substance use care under the regulation of 42 Code of Federal Regulations (CFR) Part 2, which includes Substance Abuse Confidentiality provisions [4]. This can be a gray area, and there may be times that a provider will need to break the confidentiality of a minor if they are concerned about their risk to self or others. Instances of abuse or neglect of an adolescent under 18 years also require reporting to state authorities. Ideally, if confidentiality is broken for any reason, it is done in partnership with the patient.

A patient-centered approach helps providers understand where their patients are in terms of their drug use and readiness for change. This allows for development of an individualized approach to engage them in treatment. Previous approaches to adolescent substance use treatment have focused solely on an abstinence-only model of care. Although abstinence is an important goal, for some youth it may not be initially possible, and providers will miss the opportunity to maintain safety and engagement for patients who may be at particularly high risk.

If the youth is injecting opioids and has an opioid use disorder, then medication treatment with buprenorphine or naltrexone can be offered in the primary care setting. A 2016 AAP policy statement [5] highlights the importance of pediatric providers utilizing buprenorphine or naltrexone (which can be prescribed in office-based settings) for adolescents with severe opioid use disorder. Providers should also identify behavioral health needs, refer to higher levels of care (e.g., residential, partial hospitalization, and intensive outpatient programs), and consult with local addiction specialists if needed.

However, the reality is that many adolescents may be ambivalent about stopping their drug use and not want to engage in treatment. For these youth, overdose education and provision of naloxone is important. Naloxone is an FDA-approved opioid antagonist for the reversal of opioid overdose, available in intramuscular, intravenous and intranasal forms. Signs of an overdose include decreased rate of breathing, difficulty waking up, or blue lips/fingernails. In addition to administering naloxone, it is important to ensure that the individual receives emergency care (e.g., call 911 or report to nearest emergency room). Unfortunately, the effects of naloxone may wear off while the ingested opioid is still active in the body requiring multiple doses, or a single dose of naloxone may be insufficient to reverse an overdose with a highly potent opioid, such as fentanyl.

Adopting and implementing a harm reduction model with youth who inject substances can help optimize their safety even if they continue to use. This model includes information about safer injection practices (e.g., using clean needles, not sharing needles, not using substances alone, avoiding mixing opioids with alcohol and other sedatives) in addition to providing access to naloxone. Online resources

for safer injection practices can help identify some of these strategies (http://harmreduction.org/wp-content/uploads/2011/12/getting-off-right.pdf). As mentioned above, if a youth is under 18, injecting substances, and does not want to engage in treatment, breaking confidentiality may be necessary to ensure the adolescent's safety. In addition, adolescents under 18 may not be able to access syringe exchange programs and providers need to safely navigate these circumstances. Decisions about when to break confidentiality should be made on a case-by-case basis and ideally with other members of the team including nurses and social workers. Based on the clinical assessment of risk, it is likely that the parents or caregivers will need to be involved in the treatment plan even if the adolescent does not want parental involvement.

Although establishing self-identity and relationships with peers is a normal developmental process during adolescence, the family is an extremely important aspect in caring for adolescents who inject drugs. Providers can help serve as a catalyst to utilize family supports in the treatment of the adolescent, as well as help families access evidenced-based care such as Adolescent Community Reinforcement Approach (ACRA) [6], Community Reinforcement and Family Training (CRAFT) [7], or mutual self-help groups (see Chaps. 6 and 14).

Pre-exposure prophalyaxis (PrEP) is another tool that helps decrease risk of HIV transmission among individuals that may be at elevated risk, including those who inject drugs. The CDC recommends its use in individuals who meet significant risk for becoming infected with HIV (Table 11.1) and was recently US Food and Drug Administration-approved for adolescents under 18 [8]. As outlined in the CDC's PrEP clinical practice guidelines [9], among individuals considering initiation of PrEP, there must be a documented HIV-negative status, renal function, and hepatitis B status.

Overdose Education and Prevention

Over the past 15 years, the rate of opioid overdose deaths has increased significantly with fatal opioid overdoses now surpassing motor vehicle crashes as the leading cause of unintentional injury death in the USA [10]. From 1999 to 2015 among 15–19-year-olds, the rate of opioid overdose deaths increased from 0.8 to 2.4 per 100,000 [11].

There are different strategies to address this increase in mortality. For example, the expansion of overdose education and naloxone distribution (OEND) programs, in addition to greater access to medication treatment for opioid use disorder, is critical. OEND focuses on identifying the risks and signs of an overdose, appropriately responding to an overdose and administering naloxone.

States vary on their naloxone policies. Massachusetts expanded OEND access and demonstrated community adoption resulting in fewer opioid overdoses [12]. Providers should become familiar with the regulations in their respective states and resources like *Prescribe to Prevent* (www.prescribetoprevent.org) or Prevent &

Protect (http://prevent-protect.org/) that provide naloxone educational tools. Youth who use opioids or have peers who use opioids (e.g., taking prescription opioids for nonmedical reasons, heroin use) should also participate in overdose education and have access to naloxone.

Pregnant Adolescents

There are limited data on female youth who use substances and are pregnant. Therefore, this section highlights evidence from adult pregnant women who use substances and describes youth-specific factors that are important for practitioners to consider.

Many pregnancies are unintended [13], but the rate of unintended pregnancy among women using substances has been reported to be as high as 86% [14]. The intersection of high-risk behaviors (e.g., adolescence, substance use, and unprotected sex) can create unintended, high-risk adolescent pregnancies. Identifying these risks early on in any pregnancy, but particularly in adolescent pregnancy, is critical to be able to help create the best outcomes for both mother and baby.

General screening tools to identify substance use in adolescents include the S2BI [15] and CRAFFT [16] screening tools (these are covered in greater depth in Chap. 3). A universal method to perinatal substance use screening can be utilized [17], and a variety of screening tools can be used to identify substance use in pregnant women such as the Drug Abuse Screening Test-10 (DAST-10) [18] for drug use and the Alcohol Use Disorders Identification Test (AUDIT) (https://www.drugabuse.gov/sites/default/files/files/AUDIT.pdf) for alcohol use.

Women who use alcohol, tobacco, marijuana, opioids, and/or other substances face a variety of other complications both prenatally and postpartum. In addition, babies of mothers who engage in substance use during pregnancy face higher rates of complications at birth and during the course of their lives including developmental challenges and higher likelihood of early substance use initiation themselves.

Alcohol Use and Pregnancy

According to a CDC report about the prevalence of drinking and risky ("binge drinking") during pregnancy, 10.2% of pregnant women consumed alcohol in the past month, and 3.1% met criteria for risky drinking [19]. The effects of alcohol intake during pregnancy are well documented, including the development of fetal alcohol spectrum disorder (FASD) and increased risk of fetal demise.

Pregnant adolescents who are drinking face these same risks. Abrupt cessation of alcohol during pregnancy can be dangerous. Table 11.2 outlines pharmacologic treatment options that may be offered to pregnant women, although they

Table 11.2 Medications for opioid and alcohol use disorder in adult pregnant women

Treatment indication	Medication	Pregnancy category
Opioid use disorder	Buprenorphine/naloxone	C
	Buprenorphine	
	Methadone	
	Naltrexone	
Opioid overdose reversal	Naloxone	
Alcohol use disorder	Acamprosate	
	Naltrexone	
	Disulfiram	

Pregnancy category "C": Risk to the fetus cannot be ruled out

are all category C—that is, that their safety has not been demonstrated in pregnant women. Consultation with the obstetrician is recommended before starting pharmacotherapy.

Marijuana Use and Pregnancy

There has been a significant shift in the perception of marijuana safety and consumption over the past decade [20]. States have passed legislation that permits the use of marijuana recreationally and medicinally, which may have further perpetuated this trend. Among a sample of pregnant women between 2007 and 2012, 3.9% reported marijuana use during pregnancy [21]. Marijuana use during pregnancy can have adverse impacts including a 50% increase in low birth weight [22]. Practitioners are encouraged to talk with their patients about marijuana use and utilize patient-centered, nonjudgmental communication techniques to both highlight the risk of use and help understand how best to support their patients through a healthy pregnancy [23].

Tobacco Use and Pregnancy

Tobacco use during pregnancy is relatively common. A 2016 National Vital Signs and Statistics Report highlights that the rate of women in 2014 smoking during pregnancy ranges between 8% and 21%, with more than 10% of pregnant women reporting that they had smoked tobacco during their first trimester [24]. The adverse effects of tobacco use during pregnancy include low birth weight, premature birth, and placental abnormalities [25]. The US Preventative Services Task Force recommends all adults, including pregnant women, be screened for tobacco use. If individuals screen positive, they recommend advice is provided about the risk and information about treatment options for the patient (e.g., behavioral therapy or pharmacotherapy).

Opioids and Pregnancy

The number of women who have used opioids during pregnancy has increased significantly over the past decade [26]. For pregnant women with an OUD, medication treatment with methadone or buprenorphine is recommended. As there are more federal regulations for the use of methadone in minors, buprenorphine may be a favored approach for those under 18. Naltrexone has not been as thoroughly studied as methadone and buprenorphine for the treatment of OUD during pregnancy, but is increasingly being used by some providers.

Polysubstance use is also commonly found among pregnant adolescents and may require a clinician to employ multiple approaches to care. Regardless of the substance of use, identifying sources of support for adolescent pregnant women as well as linking them to services that may augment their family support (e.g., experienced behavioral health provider) can help promote a healthy pregnancy and postpartum period.

Lesbian, Gay, Bisexual, Transgender, Queer, and Questioning (LGBTQ) Youth

Many LGBTQ youth face stressors that may lead to a variety of adverse outcomes. LGBTQ adolescents may face increased rates of school-related victimization and stress, which may contribute to increased substance use [27]. As such, it is estimated that rates of substance use among this population are 190% higher than their non-LGBTQ youth counterparts [28]. Within the LGBTQ population, bisexual youth and females may face even higher rates of substance use [28].

Access to adequate substance use treatment for adolescents can be challenging and further impacted by limited resources for LGBTQ youth. Providers have an opportunity to provide affirming and welcoming care to LGBTQ youth in their practices. Online resources can help identify strategies to incorporate these practices (http://www.lgbthealtheducation.org/wp-content/uploads/13-017_TransBestPracticesforFrontlineStaff_v6_02-19-13_FINAL.pdf). Part of this informed care includes developing an understanding of the LGBTQ-friendly community resources that one would be able to refer their patients to if they need additional services beyond their scope of practice.

Incarcerated Youth

Rates of incarceration among youth have decreased over the past several years, but the proportion of minority individuals, particularly males, remains high. Data from a 2016 Juvenile Justice Census Report highlights an 11% decrease in

youth incarceration from 2012 to 2014. However, substance use remains common, with over 80% of incarcerated youth having some substance use involvement [29].

Incarceration and post-incarceration are particularly vulnerable times for youth who may have used substances prior to entry, as they may be at increased risk for overdose or relapse if they are not provided substance use treatment during incarceration or upon reintegration into the community. Providing youth treatment in tandem with additional resources like job training and overdose education may help provide support during a particularly vulnerable period.

Homeless Youth

Youth who use substances are particularly susceptible to homelessness, which may include living in an institution, on the street, or "couch-surfing" from house to house. Youth may access drop-in centers or shelters as their primary meets of accessing care [30] and maintaining safety [31, 32]. Improving access to housing and addiction treatment may help decrease the likelihood of some high-risk behaviors for this population, including "risky income generation" [33]. Providers have the opportunity to build relationships with these centers to help engage youth in ongoing medical care and treatment.

Summary

Youth who use substances face a variety of unique challenges that primary care providers can help navigate. A patient-centered approach that helps maintain patient safety by identifying risks with the primary goal of minimizing harms and long-term adverse effects in the adolescent. Incorporating evidenced-based practices (e.g., medication treatment with buprenorphine/naloxone or naltrexone) into pediatric settings along with identifying higher levels of care when needed can help bring best practices to the primary care office.

Consent and confidentiality are cornerstones of care, particularly among youth who inject substances that may be under 18. Harm reduction models, including OEND as well as safer injection practices, can help support safety for youth at increased risk of negative outcomes.

Other populations, including pregnant, homeless, and LGBTQ youth, require special consideration in identifying their risks and unique needs. Primary care practitioners have the relationship with their patients to be able to help identify these risks and gaps in care, support their patients' needs, and decrease long-term consequence and harms.

Take-Home Points

- Youth who use substances need an individual approach to preventative services and treatment including screening for STIs and other infectious diseases and mental health disorders.
- In each population, providers play a key role in developing a therapeutic and trusting relationship with their patients.
- Safety, consent, and confidentiality should help serve as cornerstones of care, ensuring that harms are minimized to the patient.
- Utilizing practices that help optimize patient safety (e.g., OEND) and incorporate evidence-based strategies (e.g., medication for OUD, behavioral therapy) can help improve patient outcomes.
- Pregnant youth who are using drugs face unique risks that support early screening, treatment, and support to promote well-being of both mother and baby.

References

1. Committee on Substance Abuse, Levy SJL, Kokotailo PK. Substance use screening, brief intervention, and referral to treatment for pediatṣricians. Pediatrics. 2011;128(5):e1330–40.
2. Collier MG, Doshani M, Asher A. Using population based hospitalization data to monitor increases in conditions causing morbidity among persons who inject drugs. J Community Health. 2018;43(3):598–603.
3. Centers for Disease Control and Prevention. Youth risk behavior survey data; 2015. www.cdc.gov/yrbs. Accessed 3 Feb 2018.
4. Electronic Code of Federal Regulations. https://www.ecfr.gov/cgi-bin/retrieveECFR?gp=3&SID=7282616ac574225f795d5849935efc45&ty=HTML&h=L&n=pt42.1.8&r=PART#se42.1.8_112. Accessed 24 July 2018.
5. Committee on Substance Use and Prevention. Medication-assisted treatment of adolescents with opioid use disorders. Pediatrics. 2016;138(3):pii:e20161893.
6. Godley SH, Meyers RJ, Smith JE, Karvinen T, Titus JC, Godley MD, et al. Adolescent community reinforcement approach (ACRA) for adolescent cannabis users. Rockville: Center for Substance Abuse Treatment, Substance Abuse and Mental Health Services Administration; 2001.
7. Kirby KC, Versek B, Kerwin ME, et al. Developing community reinforcement and family training (CRAFT) for parents of treatment-resistant adolescents. J Child Adolesc Subst Abuse. 2015;24(3):155–65.
8. US Department of Health and Human Services. Item of interest: FDA approves PrEP therapy for adolescents at risk of HIV. https://www.nichd.nih.gov/newsroom/releases/051618-PrEP. Accessed 16 May 2018.
9. Centers for Disease Control and Prevention, Department of Health and Human Services. US Public Health Service: Preexposure prophylaxis for the prevention of HIV infection in the United States-2014:67. https://www.cdc.gov/hiv/pdf/prepguidelines2014.pdf. Accessed 3 Feb 2018.
10. Hedegaard H, Warner M, Minino AM. Drug overdose deaths in the United States, 1999–2016. US Department of Health and Human Services, Centers for Disease Control and Prevention,

National Center for Health Statistics; 2017:8. https://www.cdc.gov/nchs/data/databriefs/db294.pdf. Accessed 3 Feb 2018.
11. Curtin SC, Tejada-Vera B, Warner M. Drug overdose deaths among adolescents aged 15–19 in the United States: 1999–2015. US Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Health Statistics; 2017:8. https://www.cdc.gov/nchs/data/databriefs/db282.pdf. Accessed 3 Feb 2018.
12. Walley AY, Xuan Z, Hackman HH, et al. Opioid overdose rates and implementation of overdose education and nasal naloxone distribution in Massachusetts: interrupted time series analysis. BMJ. 2013;346:f174.
13. Finer LB, Zolna MR. Declines in unintended pregnancy in the United States, 2008–2011. N Engl J Med. 2016;374(9):843–52.
14. Heil SH, Jones HE, Arria A, et al. Unintended pregnancy in opioid-abusing women. J Subst Abus Treat. 2011;40(2):199–202.
15. Levy S, Weiss R, Sherritt L, et al. An electronic screen for triaging adolescent substance use by risk levels. JAMA Pediatr. 2014;168(9):822.
16. Knight JR, Sherritt L, Shrier LA, Harris SK, Chang G. Validity of the CRAFFT substance abuse screening test among adolescent clinic patients. Arch Pediatr Adolesc Med. 2002;156(6):607.
17. Wright TE, Terplan M, Ondersma SJ, et al. The role of screening, brief intervention, and referral to treatment in the perinatal period. Am J Obstet Gynecol. 2016;215(5):539–47.
18. Yudko E, Lozhkina O, Fouts A. A comprehensive review of the psychometric properties of the Drug Abuse Screening Test. J Subst Abus Treat. 2007;32(2):189–98.
19. Tan CH, Denny CH, Cheal NE, Sniezek JE, Kanny D. Alcohol use and binge drinking among women of childbearing age – United States, 2011–2013. MMWR Morb Mortal Wkly Rep. 2015;64(37):1042–6.
20. Young-Wolff KC, Tucker L-Y, Alexeeff S, et al. Trends in self-reported and biochemically tested marijuana use among pregnant females in California from 2009–2016. JAMA. 2017;318(24):2490.
21. Brown QL, Sarvet AL, Shmulewitz D, Martins SS, Wall MM, Hasin DS. Trends in marijuana use among pregnant and nonpregnant reproductive-aged women, 2002–2014. JAMA. 2017;317(2):207–9.
22. Crume TL, Juhl AL, Brooks-Russell A, Hall KE, Wymore E, Borgelt LM. Cannabis use during the perinatal period in a state with legalized recreational and medical marijuana: the association between maternal characteristics, breastfeeding patterns, and neonatal outcomes. J Pediatr. 2018;197:90–6.
23. Hennessy G. Marijuana and pregnancy. Am J Addict. 2018;27(1):44–5.
24. Curtin SC, Matthews TJ. Smoking prevalence and cessation before and during pregnancy: data from the birth certificate, 2014. Natl Vital Stat Rep Cent Dis Control Prev Natl Cent Health Stat Natl Vital Stat Syst. 2016;65(1):1–14.
25. Drake P, Driscoll AK, Matthews TJ. Cigarette smoking during pregnancy: United States, 2016. US Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Health Statistics; 2018:8. https://www.cdc.gov/nchs/data/databriefs/db305.pdf. Accessed 7 Mar 2018.
26. Salihu HM, Mogos MF, Salinas-Miranda AA, Salemi JL, Whiteman VE. National trends in maternal use of opioid drugs among pregnancy-related hospitalizations in the United States, 1998 to 2009. Am J Perinatol. 2015;32(3):289–98.
27. Huebner DM, Thoma BC, Neilands TB. School victimization and substance use among lesbian, gay, bisexual, and transgender adolescents. Prev Sci Off J Soc Prev Res. 2015;16(5):734–43.
28. Marshal MP, Friedman MS, Stall R, et al. Sexual orientation and adolescent substance use: a meta-analysis and methodological review. Addict Abingdon Engl. 2008;103(4):546–56.
29. Hockenberry S, Wachter A, Sladky A. Juvenile residential facility census selected findings. US Department of Justice, Office of Justice Programs, Office of Juvenile Justice and Delinquency Prevention; 2016:20. https://www.ojjdp.gov/pubs/250123.pdf. Accessed 3 Feb 2018.

30. De Rosa CJ, Montgomery SB, Kipke MD, Iverson E, Ma JL, Unger JB. Service utilization among homeless and runaway youth in Los Angeles, California: rates and reasons. J Adolesc Health Off Publ Soc Adolesc Med. 1999;24(3):190–200.
31. Krüsi A, Fast D, Small W, Wood E, Kerr T. Social and structural barriers to housing among street-involved youth who use illicit drugs. Health Soc Care Community. 2010;18(3):282–8.
32. Tozer K, Tzemis D, Amlani A, et al. Reorienting risk to resilience: street-involved youth perspectives on preventing the transition to injection drug use. BMC Public Health. 2015;15:800.
33. Cheng T, Kerr T, Small W, Nguyen P, Wood E, DeBeck K. High prevalence of risky income generation among street-involved youth in a Canadian setting. Int J Drug Policy. 2016;28:91–7.

Part IV
Clinical Vignettes

Chapter 12
Case Study 1: Screening

Jessica Gray

Ben, a 14-year-old male, is brought in to his primary care physician by his parents after he is caught smoking marijuana with friends. His parents report worrying about his drug use, his declining school performance, and how he has distanced himself from them over the last few months. His medical and surgical history are unremarkable. His family history (provided by his mother) includes a maternal grandfather with alcohol use disorder who is now in long-term recovery. He lives with his parents and his younger sister, who are healthy. He is a sophomore in high school and his grades are B and C's, but worsening.

Primary care physician (PCP): Ben, I asked your parents to step out as I do at every teen visit to check in about how things are going. As a reminder, what you share with me in this visit is strictly confidential and will not be shared with your parents or anyone else. The one exception is if I feel your life is in danger or there is a risk you could harm someone else. In that situation, I would need to speak with your parents, but you and I would discuss beforehand the best way for me to talk to them.

Ben: Things are fine.

PCP: I'm glad you feel that way. It sounds like your parents have been worried about you ever since they found you smoking marijuana with friends. Would you share your perspective on what's been going on?

Ben: It's no big deal; I just smoke with my friends occasionally to chill out. It's not like I've done any other drugs or anything. It's even legal in some states. My parents found out and completely blew it out of proportion, and now I'm grounded.

J. Gray (✉)
Departments of Medicine and Pediatrics, Massachusetts General Hospital/Harvard Medical School, Boston, MA, USA
e-mail: jgray7@partners.org

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PCP: Okay. Let me ask you a few questions. During the past 12 months, on how many days did you drink more than a few sips of beer, wine, or any drink containing alcohol?

Ben: None. I know people at school who drink, but I'm not into that.

PCP: And during the past 12 months, on how many days did you use any marijuana, like weed, oil, or hash by smoking, vaping, or in food or synthetic marijuana like "K2" or "spice"?

Ben: I'm not sure. Um, probably at least ten times, I guess.

PCP: To help me better understand, how did you use marijuana? Did you smoke it or use it another way?

Ben: Oh, we always just smoke joints.

PCP: How much do you smoke on days when you do smoke?

Ben: Usually just one joint.

PCP: Thanks for clarifying. During the past 12 months, on how many days did you use anything else to get high, like other illegal drugs, prescription or over-the-counter medications, and things that you sniff, huff, or vape?

Ben: I don't do any of that kind of stuff.

PCP: Okay, a few more questions… have you ever ridden in a CAR driven by someone who was high or has been using alcohol or other drugs?

Ben: No way.

PCP: That is a smart choice and I'd love to know what your plan would be in a situation where you felt pressured to get in someone's car. But let me ask you a few more questions first. Do you ever use alcohol or drugs to RELAX, feel better about yourself, or fit in?

Ben: Yeah.

PCP: Do you ever use marijuana, alcohol, or other drugs ALONE?

Ben: I have in the past. I did when I was stressed out.

PCP: Do you ever FORGET things you did while using alcohol or other drugs?

Ben: I don't think so.

PCP: Do your FAMILY or FRIENDS ever tell you that you should cut down on your drinking or drug use?

Ben: Well, my parents have been on my case, but not my friends. They smoke with me and think I'm funny when I'm high.

PCP: Aside from this most recent episode with your parents, have there been other times where you have gotten into TROUBLE while you were using alcohol or other drugs?

Ben: My grades haven't been the greatest lately, and my teacher has been bothering me about my homework, but I can't tell if it's related. School is just getting hard.

PCP: Thanks for sharing Ben. I appreciate your honesty. I'd like to talk some more about your marijuana use to understand what you like about it…and how it may be affecting you.

This patient reported 10 days of marijuana use in the past 12 months, then indicated no days of use of alcohol or anything else to get high. Thus, the clinician proceeded to ask all six CRAFFT questions. The CRAFFT score was four (i.e., *affirmative answers to the questions "Relax," "Alone," "Family/Friends," and "Trouble"), indicating that the patient has a very high likelihood (approximately 92%) of a cannabis use disorder. Next steps for the clinician should be to review the screening results with the patient, make a recommendation not to use marijuana, counsel regarding ensuring safe rides to reduce the risk of driving intoxicated or riding with someone intoxicated, elicit self-motivational statements, and reinforce self-efficacy.*

Considerations:

- The CRAFFT screening Tool is an evidence-based validated tool for both screening and assessment of substance misuse in adolescents in primary care [1, 2] that has been endorsed by the American Academy of Pediatrics (AAP) [3].
- The *CRAFFT* screen should be used to initiate a conversation with adolescents around their substance use. While the screen does not produce a formal diagnosis of substance use disorder, the screen is positive if a patient gives two or more affirmative answers, and the greater number of affirmative responses increases the risk of having a substance use disorder.
- Screening for substance use should be conducted confidentially without a parent or guardian present and with a clearly stated confidentiality policy.
- The *CRAFFT* is meant to be used as part of a screening, brief intervention, and referral to treatment (SBIRT) model, through which the clinician can offer brief advice, encourage behavior change through a motivational interview, or refer to treatment depending on the level of concern [3].

Conclusion

Ben and his PCP had a deeper discussion about his motivations for using marijuana. The PCP's use of motivational interviewing techniques helped Ben identify some reasons to reduce his marijuana use. They agreed to follow up in 4 weeks to check on Ben's self-directed goal of trying a period without marijuana use. In this case example, one can see the utility of the *CRAFFT* screen in primary care. The *CRAFFT* screen is a validated, developmentally appropriate, and easy-to-use screen for determining the risk of substance use disorders in adolescents and can easily be integrated into primary care visits [3].

References

1. Knight JR, Sherritt L, Shrier LA, Harris SK, Chang G. Validity of the CRAFFT substance abuse screening test among adolescent clinic patients. Arch Pediatr Adolesc Med. 2002;156(6):607–14.
2. Mitchell SG, Kelly SM, Gryczynski J, Myers CP, O'Grady KE, Kirk AS, Schwartz RP. The CRAFFT cut-points and DSM-5 criteria for alcohol and other drugs: a reevaluation and reexamination. Subst Abus. 2014;35(4):376–80.
3. American Academy of Pediatrics. Substance use screening, brief intervention, and referral to treatment for pediatricians. Pediatrics. 2011;126(5):e1330–40.

Chapter 13
Case Study 2: Navigating Treatment Settings

Dana Sarvey

Allison is a 17-year-old Caucasian female with major depressive disorder, generalized anxiety disorder, and a past history of trauma who is endorsing moderate to severe depressive symptoms, hopelessness, and poor school attendance in the setting of escalating intranasal heroin use. She has had one past psychiatric hospitalization for depression and has made two previous suicide attempts via overdose on her prescription medications.

An initial screening in the outpatient setting reveals that Allison has a 2-year history of smoking cannabis, the onset of which coincided with the start of her depressive symptoms. While her use of cannabis began as recreational, it escalated to daily use approximately 1 year ago to manage her social anxiety following a sexual assault. She also often consumes alcohol in excess while at parties and social events. Allison confirms previous episodes of blacking out while intoxicated but denies any past withdrawal symptoms from alcohol and does not typically experience cravings to use.

Allison became romantically involved with an older male peer who introduced her to prescription opioids 2 months ago, which quickly escalated to intranasal heroin use. She describes heroin as both "the worst and best thing that has ever happened to me." When intoxicated, Allison experiences an instant relief from her anxiety and mood symptoms. However, she recognizes that her mood has become progressively worse since she started using heroin. She also feels the need to use daily in order to avoid cravings and withdrawal symptoms, both of which have become stronger over the past 2 weeks. Allison has missed more than half of the last school semester and is now in danger of not graduating on time. This has led to profound hopelessness. She requests assistance with her opioid use but is unsure of whether she wants complete abstinence from all drugs.

D. Sarvey (✉)
Department of Child and Adolescent Psychiatry, McLean Hospital, Belmont, MA, USA

Harvard Medical School, Boston, MA, USA
e-mail: dsarvey@partners.org

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Treatment Considerations

- A history of trauma has been correlated with a greater likelihood of initiation of illicit substance use during adolescence [1]. Clinicians should carefully screen adolescents with a history of trauma for any substance use and vice versa.
- Treatment of underlying psychiatric illness in addition to any substance use disorder (dual diagnosis) has been found to be superior to treating only substance use disorders [2] in adolescents.
- Consider the ASAM levels of care as a guide (see Fig. 4.1 in Chap. 4) to determine which level of care is most appropriate for this patient [3].
- Safety should be the primary consideration when determining placement options for adolescents with a history of psychiatric illness. If an adolescent endorses suicidal thinking and/or an intent to act upon these thoughts, an inpatient psychiatric unit with licensure to treat withdrawal is the best option.
- If there are no acute safety concerns, the extent of physiologic withdrawal should be determined, as well as the level of motivation for treatment.

Conclusion

Allison was referred for an acute inpatient medical hospitalization (ASAM level 4) given the extent of her decline in functioning, past history of suicide attempts, and ongoing hopelessness. While there, she was started on escitalopram 5 mg daily to improve her mood and buprenorphine/naloxone 4 mg/1 mg sublingually each morning. The medication-assisted treatment diminished her cravings and allowed her to consider more intensive psychiatric treatment, in the form of an acute residential program for 2 weeks (level 3.3), specifically for adolescents who are dually diagnosed.

After completing a cognitive behavioral therapy curriculum in the residential program, Allison developed a better understanding of her emotions and improved her distress tolerance through regular skill use. Four weeks later while continuing on a maintenance dose of buprenorphine/naloxone, Allison enrolled within an intensive outpatient program (ASAM level 2.1) in the evenings and returned to school. This allowed her to be within a group setting with other dually diagnosed adolescents recovering from substance use. Although Allison has remained abstinent from all opioids, she remains ambivalent about stopping all substance use and is still using cannabis on occasion. She continues to work with her outpatient provider (ASAM level 1), who utilizes motivational interviewing and contingency management as a means of addressing her motivation to change.

References

1. Carliner H, Keyes K, McLaughlin K, et al. Childhood trauma and illicit drug use in adolescence: a population-based national comorbidity survey replication-adolescent supplement study. J Am Acad Child Adolesc Psychiatry. 2016;55(8):701–8.
2. Ramchand R, Griffin B, Hunter S, et al. Provision of mental health services as a quality indicator for adolescent substance abuse treatment facilities. Psychiatr Serv. 2015;66:41–8.
3. Mee-Lee D. The ASAM criteria: treatment criteria for addictive, substance-related, and co-occurring conditions. 3rd ed. American Society of Addiction Medicine; 2013. https://www.asam.org/resources/the-asam-criteria. Accessed 28 July 2018.

Chapter 14
Case Study 3: Confidentiality and Parental Involvement

Nicholas Chadi

Christopher is a 19-year-old male with a previous diagnosis of attention deficit hyperactivity disorder and a 6-year history of alcohol and cigarette use. He was also diagnosed with social anxiety disorder and a major depressive episode at age 16. He currently takes atomoxetine, methylphenidate, and fluoxetine and receives injectable naltrexone every 4 weeks for severe alcohol use disorder. He has had one previous inpatient psychiatric admission and a 4-week admission to a residential program for alcohol use disorder, both at the age of 16. He has since been followed in an outpatient substance use program.

A careful history by Christopher's outpatient psychiatrist reveals that he started drinking "socially" with his friends at age 13. At first, he was drinking two to three beers approximately once per week, but his use quickly escalated to seven to eight beers multiple times per week. At age 14, he started consuming unconventional alcohols including mouthwash and rubbing alcohol on a daily basis. His parents discovered his daily use of alcohol when he was 15. After several months of inpatient and outpatient treatment, including monthly naltrexone injections and weekly individual counseling sessions, Christopher maintained sobriety for over 3 years until a few days before the current visit.

Today, Christopher mentions that he no longer wishes to receive injectable naltrexone and would like to become more independent from his parents. He had called the clinic the day prior to revoke consent allowing parental involvement in his care. Christopher explains that he is still living with his parents. He denies any recent tobacco or illicit drug use but admits that he ended his 3-year period of abstinence the previous weekend when he had a few beers with his colleagues after work. He also admits that he skipped his last naltrexone injection, has stopped attending weekly AA meetings, and has not spoken with his sponsor in over 2 months.

N. Chadi, MD (✉)
Division of Developmental Medicine, Adolescent Substance Use and Addiction Program, Boston Children's Hospital, Harvard Medical School, Boston, MA, USA
e-mail: nicholas.chadi@childrens.harvard.edu

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Christopher's mother, who has always been very invested in his care, contacted the patient's individual therapist and left a voicemail explaining that she is very concerned about her son. She added that Christopher has been going out and driving his car late at night and has not been respecting curfew for the past 2 weeks.

Considerations

- Adolescence is a period during which youth attain independence and acquire the skills to live autonomously [1]. The age at which adolescents achieve social developmental milestones varies, and national census data shows that 15% of 25- to 35-year-olds in America still live with their parents [2].
- Parental involvement has been shown to be a protective factor in the prevention of substance use disorders as well as a positive prognostic factor in treatment of youth with problems related to substance use [3].
- Parents or legal guardians of youth under age 18 usually have the final word on consent and medical decision-making. However, certain exceptions exist, for example, when minors are considered mature minors or emancipated minors. These exceptions may vary in different jurisdictions [4]. After age 18, youth have the right to deny parental involvement in medical care or access to medical records.
- Confidentiality of treatment is one of the key tenets of adolescent and young adult care and is an important element of rapport building and therapeutic alliance formation [5]. Confidentiality laws stipulate that medical information shared by minors should be kept confidential unless it involves safety or harm of the patient or of other minors, in which case it should immediately be disclosed to a parent or guardian.
- In some circumstances, when the safety of an adolescent or young adult over age 18 is at stake, family members may decide to have the young person treated or admitted to a hospital against their will, in which case they become the medical decision-makers for the youth. However, it remains unclear if such "involuntary" commitments to substance use treatment result in improved outcomes.

Conclusion

Upon further discussion with his psychiatrist, Christopher endorses a significant increase in cravings for alcohol which started the week he was due for his last dose of injectable naltrexone. He admits to having fleeting thoughts about buying a bottle of vodka to drink alone, and that the idea of doing this in secret is thrilling for him. Christopher is counseled about the potential risks of relapse given his complex past substance use history. He is also told about the benefits of maintaining parental involvement in his care, given that both his parents have been helpful support figures through the years.

Christopher admits that he has mixed feelings about his decision to revoke consent for parental involvement. He explains that he has recently started seeing a new

girlfriend who told him that at age 19 he should be less dependent on his parents. Christopher's psychiatrist used a motivational approach throughout the interview to help Christopher explore the pros and cons of drinking and re-signing consent for continued parental involvement in his care. After discussion, Christopher concludes that the advantages of maintaining his sobriety outweigh the benefits of "social drinking" with his work colleagues given the risk of relapse into problem drinking. He signs consent for parental involvement, agrees to resume naltrexone injections to help with his cravings, and commits to attending weekly AA meetings and reconnecting with his sponsor.

References

1. Christie D, Viner R. Adolescent development. BMJ. 2005;330:301–4.
2. Fry R. More young adults are living at home, and for longer stretches. Pew Research Center. http://www.pewresearch.org/fact-tank/2017/05/05/its-becoming-more-common-for-young-adults-to-live-at-home-and-for-longer-stretches/. Accessed 22 Apr 2018.
3. Hernandez L, Rodriguez AM, Spirito A. Brief family-based intervention for substance abusing adolescents. Child Adolesc Psychiatr Clin N Am. 2015;24:585–99.
4. Partridge BC. The mature minor: some critical psychological reflections on the empirical bases. J Med Philos. 2013;38:283–99.
5. Bagley S, Shrier L, Levy S. Talking to adolescents about alcohol, drugs and sexuality. Minerva Pediatr. 2014;66:77–87.

Chapter 15
Case Study 4: Buprenorphine Induction

Jungjin Kim

Stacey is a 17-year-old female with an opioid use disorder. She comes to your office requesting help quitting heroin. Stacey has been addicted to opioids for almost a year and successfully completed a detoxification followed by residential treatment. Despite continued outpatient treatment afterwards, she relapsed 2 months ago and has been injecting approximately 1 gram of heroin daily. One of her friends has been doing well taking buprenorphine. She asks you if this might be an option.

Considerations

- Long-term medication-assisted treatment with buprenorphine is an effective and viable option for treating adolescents with opioid use disorders [1].
- Buprenorphine is a partial opioid agonist that binds to the mu-opioid receptors and is slow to dissociate. Its affinity for the opioid receptors is higher than that of heroin. When administered to a patient who has used heroin in the last 6–12 h, buprenorphine displaces heroin from mu-opioid receptors, thereby precipitating withdrawal symptoms.
- Buprenorphine is commonly prescribed as a buprenorphine/naloxone (4:1) combination formulation. The presence of naloxone mitigates the risk of misuse by injection. Naloxone is an opioid antagonist that blocks the effects of opioids and precipitates severe withdrawal when injected; when taken as directed sublingually, the risk of withdrawal is markedly lowered since naloxone is poorly absorbed from the gastrointestinal tract.

J. Kim (✉)
Division of Alcohol and Drug Abuse, McLean Hospital/Harvard Medical School, Belmont, MA, USA
e-mail: jkim10@mclean.harvard.edu

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- Buprenorphine is considered much safer than other opioid agonist treatments due to its ceiling effect. Ceiling effect refers to plateauing of opioid agonist effects after linear increase with dose escalation. When combined with other drugs (e.g., alcohol, benzodiazepines, or other sedatives), respiratory depression and death may still occur.
- A typical target daily dose is 12/3 mg to 16/4 mg daily, though many adolescents require only 8/2 mg daily [2].

How Would You Implement an Office-Based Buprenorphine/Naloxone Induction?

Day 1

Patients must achieve a short period of abstinence before their first buprenorphine dose. For short-acting opioids like heroin, stopping all opioid use for 10–12 h before the scheduled induction time is adequate. For longer-acting opioids, abstinence for as long as 24–36 h may be needed. If Stacey stops using the evening before induction, she should show signs of mild-to-moderate withdrawal when she visits the office the next morning. Withdrawal symptoms can be measured with an objective scale like the Clinical Opiate Withdrawal Scale (COWS), an 11-item clinician-administered scale [3]. A score of 8–10 before the first dose (2 or 4 mg) decreases the risk of developing precipitated withdrawal caused by the binding affinity of buprenorphine and its partial agonist properties.

Once a patient is given the initial 2/0.5 or 4/1 mg of buprenorphine/naloxone, they should be observed for 1–2 h. If withdrawal symptoms reappear, another dose of 2/0.5 or 4/1 mg can be administered. Some prescribers provide the option of taking an additional dose at home that evening, particularly if a parent is available to supervise the dose. The maximum first-day dose ranges from 8/2 mg to 12/3 mg.

Stacey receives a total dose of 12/3 mg the first day with significant improvement in withdrawal symptoms. In the case of precipitated withdrawal, management options include loading with additional doses of buprenorphine and treating with as needed medications such as lofexidine or clonidine (alpha2-adrenergic agonists that dampen sympathetic overdrive symptoms), antihistamines (which can aid symptoms of agitation and insomnia), antispasmodics, and anti-diarrheals.

Day 2

During her follow-up visit the next day, Stacey endorses ongoing symptoms of restlessness and cravings. She is started on a total daily dose of 16/4 mg as her initial maintenance dose.

Day 3 (If Needed)

Stacey stabilized on 16/4 mg per day as a maintenance dose, so the following management was not required. In cases where the patient is still experiencing withdrawal symptoms or cravings after taking 16 mg of buprenorphine, the clinician should check to make sure the patient is taking the medication properly. If the patient is taking the medication as instructed, the dose may be increased again in the same manner. The FDA-approved dosage is up to 24/6 mg daily, although most patients stabilize on 12/3–16/4 mg daily. Additionally, since doses higher than 16/4 mg daily are relatively uncommon (particularly among adolescents), many insurance companies will require a prior authorization before initiating a daily dose of ≥16/4 mg.

References

1. Committee on Substance Use and Prevention. Medication-assisted treatment of adolescents with opioid use disorders. Pediatrics. 2016;138(3):e20161893.
2. Subramanian G, Levy S. Treatment of opioid-dependent adolescents and young adults using sublingual buprenorphine. Providers' clinical support system for medication assisted treatment. Providence: American Academy of Addiction Psychiatry; 2013.
3. Wesson DR, Ling W. The clinical opiate withdrawal scale (COWS). J Psychoactive Drugs. 2003;35(2):253–9.

Chapter 16
Case Study 5: Adolescent Community Reinforcement Approach – Functional Analysis

Jennifer Woolard

Tom, a 16-year-old male, smokes cannabis at his best friend's house every day after school. He started smoking marijuana when he was 14 years old on the weekends with friends. After he was cut from the basketball team, he began spending time with his friends every day after school. One of the most important procedures from the adolescent community reinforcement approach (A-CRA) is the functional analysis (FA) of substance using behavior [1, 2]. The adolescent community reinforcement approach (A-CRA) is an evidence-based therapy for the treatment of substance use [3]. This procedure explores a client's external and internal triggers for drug use. The chain of events is examined by asking questions about the who, what, when, where, and why of substance use.

Considerations

- Triggers are experiences, thoughts, or emotional cues that may influence a client to use. Drug use does not just happen, but is instead influenced by a number of small decisions within the client's control, often in response to triggers. Triggers might include cues in the environment, such as places that the client has used substances in the past.
- The FA provides information to identify healthier ways to replace the function that alcohol and other drug use serve. For example, Tom could go to the local gym to play basketball instead of smoking marijuana with friends, which would still allow him to build and maintain peer relationships.

J. Woolard (✉)
LCSW Emory Adolescent Substance Use Treatment Services,
Division of Child, Adolescent and Young Adult Programs,
Emory Healthcare, Atlanta, GA, USA
e-mail: Jennifer.woolard@emoryhealthcare.org

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- Clinicians often start the FA by exploring patterns of use, such as what specific substance they use (separate FAs are required for those with multiple drugs of choice unless they are always used together), how much they use, how often, and for how long they have used each substance (duration).
- The FA identifies positive and negative consequences of substance use. Exploring positive consequences increases engagement, showing an understanding that without some benefit, the use would not be as enticing for the adolescent.
- The FA of substance use provides detailed clinical information that is used throughout treatment. The information can also become the outline for goals in treatment (goals of counseling).

Conclusions

The information about Tom smoking at his friend's house after school covers potential external triggers for use, such as who Tom is typically with when using, where he usually uses, and when (time of day) he uses. Tom enjoys using at his friend's house and states that there, "there is nobody to get on my case about stuff" and where his friend's parents are "pretty laid back about smoking weed." Tom likes smoking with his friend because they "just chill out, especially after spending the whole day at school."

Tom also thinks about how relaxed he feels after smoking marijuana but is unable to recall any physical sensations or what his typical emotional state is before smoking. This can be a point where the clinician provides education about recognizing internal cues, such as the feeling of anticipation or anxiety.

Identifying negative consequences helps the client correlate a connection between substance use and consequences. Tom recognizes a strained relationship with his parents. He states, "they're always on my back and taking away things like my phone when they find out I'm smoking." His use also impacts his relationship with his girlfriend. "She'd probably be happier if I cut down. She also gets mad when I can't talk because I don't have a phone." He has also experienced a suspension from school for possession on school grounds.

Tom's triggers and positive consequences are reinforcing his cannabis use. Without intervention, he will likely continue spending time with friends in an environment encouraging substance use with minimal parental supervision. Discovering alternative peer networks or activities after school can decrease risk for use. Finding healthier, substance-free ways to achieve some of the benefits Tom perceives in his substance use should be explored. Providing material about the effect of substance use on Tom's relationships can be used later as reinforcements for change. In addition, the clinician can provide parent guidance around clear expectations for abstinence and how to support Tom in doing alternative activities using positive communication and problem-solving skills.

Information on certification and additional resources for A-CRA can be found at: http://ebtx.chestnut.org/Treatments-and-Research/Treatments/A-CRA.

References

1. Godley SH, Meyers RJ, Smith JE, Godley MD, Titus JC, Karvinen T, et al. The adolescent community reinforcement approach (ACRA) for adolescent cannabis users (DHHS publication no. (SMA) 01-3489, Cannabis youth treatment (CYT) manual series, vol. 4). Rockville: Center for Substance Abuse Treatment, Substance Abuse and Mental Health Services Administration; 2001.
2. Godley SH, Smith JE, Meyers RJ, Godley MD. The adolescent community reinforcement approach: a clinical guide for treating substance use disorders. Normal: Chestnut Health Systems; 2016.
3. Dennis ML, Godley SH, Diamond GS, Tims FM, Babor T, Donaldson J, et al. The Cannabis Youth Treatment (CYT) Study: main findings from two randomized trials. J Subst Abus Treat. 2004;27:197–213.

Chapter 17
Case Study 6: Treatments for Alcohol Use Disorder

Collin M. Reiff

Susan is a 20-year-old female college student with an alcohol use disorder, who was recently charged with driving under the influence (DUI). Over the course of the past year, she has blacked out on five separate occasions while intoxicated. After one of her blackouts, she awoke on an inpatient medical ward, where she was treated for alcohol poisoning.

A careful history reveals that Susan began drinking beer at the age of 15. Over the past year, her alcohol use has escalated from two to three bottles of beer (12 oz./bottle ≈ 5% alcohol) on one or two occasions per month to two to three glasses of distilled spirits (1.5 oz./glass ≈ 40% alcohol) 5 days per week. Her drink of choice is currently whiskey. She enjoys the smoky taste and usually has two to five glasses of whiskey after returning home at the end of the day. Her drinking has caused her to oversleep and miss class. On one occasion, she attended class while intoxicated. She often drinks before going out with friends, because she feels like alcohol decreases her social anxiety and allows her to be her "true self." She wants to stop using alcohol due to her recent legal trouble, but is worried that she will not have the strength to resist her alcohol cravings.

Susan's last drink was approximately 18 h ago, and her urine drug testing is unremarkable for other substances. On laboratory screening, her liver function tests are within normal limits, her creatinine is 1.0, and her glomerular filtration rate is >60 mL/min.

C. M. Reiff (✉)
Department of Psychiatry, New York University School of Medicine, New York, NY, USA
e-mail: collin.reiff@nyumc.org

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Considerations

What medications would you consider prescribing to Susan for alcohol use disorder? Which medication is the most appropriate at this time (Table 17.1)?

Since Susan does not live with her family or a partner that is involved in her clinical care, there is nobody to supervise, support, and reinforce disulfiram adherence at home. This lack of medication oversight limits the effectiveness of disulfiram in the outpatient setting [9]. While acamprosate appears to be effective in adults, its three times daily dosing can make adherence challenging.

Given Susan's normal liver function, negative UDS, and recent alcohol use, her treatment team advises starting naltrexone. If Susan tolerates the oral formulation of naltrexone well, she will be offered naltrexone IM (Vivitrol®), which will likely facilitate medication adherence.

Table 17.1 Medications for alcohol use disorder

	Acamprosate	Naltrexone	Disulfiram
FDA approval	FDA-approved anti-craving agent for alcohol use disorder in adults ≥18 years.	FDA-approved anti-craving agent for alcohol use disorder and prevention of relapse in opioid dependence in adults ≥18 years.	FDA-approved aversive agent for alcohol use disorder in adults ≥18 years.
Mechanism of action	Reduces excitatory glutamate neurotransmission and increases inhibitory GABA neurotransmission. Binds to and blocks glutamate receptors, which can decrease the effects of excessive glutamate activity, while increasing GABA activity [1].	Reduces alcohol consumption through modulation of the opioid system, which is involved in the sensation of craving. May restore the central balance of the endogenous opioid system that is disrupted by prolonged alcohol exposure [2].	Inhibits the enzyme aldehyde dehydrogenase, which typically catalyzes the conversion of acetaldehyde to acetate. Causes levels of acetaldehyde to accumulate, leading to an uncomfortable and adverse experience: headache, flushing of the face, nausea, vomiting, and sweating. The negative experience ideally leads to conditioning in which the patient starts to avoid alcohol [3].

Table 17.1 (continued)

	Acamprosate	Naltrexone	Disulfiram
Evidence base	Preliminary evidence demonstrates that it is safe and well tolerated in adolescents. RCT $n = 26$ acamprosate (1332 mg Q day) demonstrated statistically higher abstinence rate in acamprosate group compared to placebo at 90 days (7/13 vs. 2/13) and greater mean cumulative abstinence duration in acamprosate group compared to placebo (79.8 days vs. 32.8 days) [4].[a]	Preliminary evidence demonstrates that it is safe and well tolerated in adolescents [5, 6]. Pilot study $n = 5$ (naltrexone 50 mg Q day) demonstrated an average reduction of 7.61 standard drinks/day from 8.94 drinks/day with a significant reduction in cravings over 6 weeks [7]. There are numerous case reports demonstrating prolonged abstinence, decreased number of drinking days, and decreased cravings with naltrexone [2].	Preliminary evidence demonstrates that it is safe and well tolerated in adolescents. RCT $n = 49$ (disulfiram 200 mg Q day) demonstrated that mean cumulative abstinence duration was significantly greater in the disulfiram group than the placebo group (68.5 days vs. 29.7 days) [8].
Dosing	Dosed 666 mg by mouth three times daily in adults (each tablet is 333 mg).	Dosed 50–100 mg by mouth daily or by a long-acting injectable 380 mg given intramuscularly every 4 weeks in adults. Tablets are 25 mg, 50 mg, or 100 mg.	Dosed 125–500 mg by mouth daily in adults. Tablets are 250 mg or 500 mg and scored. Give at least 12 h after the last alcoholic drink.
Additional considerations	Contraindicated in patients with severe renal impairment (creatinine clearance ≤30 mL/min) [1]; lower doses, such as 333 mg by mouth three times daily, may be used in patients with milder renal impairment. Three times daily dosing may be difficult for patients and limit medication adherence [1, 4].	Check hepatic function before initiation. Patients should be opioid-free for 7–10 days prior to initiation of treatment as confirmed by urine drug test to avoid inducing opioid withdrawal. Long-acting injectable formulation may be associated with improved medication adherence.	Most efficacious when daily self-administration is supervised and supported.

[a]The original article reporting on the efficacy of acamprosate for treating alcohol use disorder in adolescence was retracted due to copyright violation.

References

1. Plosker GL. Acamprosate: a review of its use in alcohol dependence. Drugs. 2015;75(11):1255–68.
2. Simkin DR, Grenoble S. Pharmacotherapies for adolescent substance use disorders. Child Adolesc Psychiatr Clin N Am. 2010;19(3):591–608. https://doi.org/10.1016/j.chc.2010.03.010.
3. Stahl SM, Grady MM, Muntner M. Stahl's essential psychopharmacology: the prescriber's guide, vol. 1–2. 4th ed. New York: Cambridge University Press; 2014. p. 195–7.
4. Niederhofer H, Staffen W. RETRACTED ARTICLE: acamprosate and its efficacy in treating alcohol dependent adolescents. Eur Child Adolesc Psychiatry. 2003;12(3):144–8.
5. Fishman MJ, Winstanley EL, Curran E, et al. Treatment of opioid dependence in adolescents and young adults with extended release naltrexone: preliminary case-series and feasibility. Addiction. 2010;105(9):1669–76.
6. Lifrak PD, Alterman AI, O'Brien CP, et al. Naltrexone for alcoholic adolescents. Am J Psychiatry. 1997;154(3):439–41.
7. Deas D, May MP, Randall C, et al. Naltrexone treatment of adolescent alcoholics: an open-label pilot study. J Child Adolesc Psychopharmacol. 2005;15(5):723–8.
8. Niederhofer H, Staffen W. Comparison of disulfiram and placebo in treatment of alcohol dependence of adolescents. Drug Alcohol Rev. 2003;22(3):295.
9. Brewer C, Streel E, Skinner M. Supervised disulfiram's superior effectiveness in alcoholism treatment: ethical, methodological, and psychological aspects. Alcohol Alcohol. 2017;52(2):213–9.

Chapter 18
Case Study 7: Relapse Prevention

Jennifer Woolard

David is 17-year-old male with a 1-year history of using benzodiazepines and stimulants and a 3-year history of drinking alcohol. He has been abstinent from all substances for 2 months and is now working on a relapse prevention plan with his counselor. To enhance community support, David's peer network is reviewed during the session. He has very few friends that support his recovery. "I barely know anyone who doesn't drink or use something." Despite some initial hesitation, he demonstrates a willingness to meet new people and try self-help meetings.

Considerations

- A relapse prevention plan helps a patient/client identify early warning signs and triggers [1] and maximizes the use of recovery tools such as self-help meetings, ongoing treatment, and support from family members. Early warning signs and triggers can include changes in an adolescent's routine or schedule, loss of connection with non-substance-using friends, and a willing exposure to known high-risk environments and situations.
- When working with adolescents, clinicians can consider referrals to self-help meetings in the community [2]. Free resources for self-help groups are Narcotics Anonymous (NA), Alcoholics Anonymous (AA), and Marijuana Anonymous (MA). They are aimed to develop peer networks desiring to live a healthy substance-free lifestyle. NA, AA, and MA meetings utilize a 12-step model, highlighting the importance of social support and a higher power. Local AA meetings can be found online at https://www.aa.org.

J. Woolard (✉)
Department of Child Psychiatry–Emory Adolescent Substance Use Treatment Service (East), Emory Healthcare, Atlanta, GA, USA
e-mail: Jennifer.woolard@emoryhealthcare.org

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- Another abstinence-based resource used is SMART (Self-Management and Recovery Training) Recovery. Unlike both AA and NA, it does not follow the 12-step model (i.e., it does not encourage individuals to admit powerlessness over their addiction or use the concept of a "higher power"), and it does not have sponsors (i.e., individuals who guide new 12-step initiates through the various steps). SMART Recovery hosts daily meetings, both in-person and online. They provide education to modify self-defeating behaviors or thoughts and encourage peer networks who support abstinence. SMART Recovery resources specifically for adolescents and young adults can be found online at https://www.smartrecovery.org/teens/.
- Contingency management uses positive reinforcement and can be an effective intervention to encourage abstinence and harm reduction [3]. Self-reports of substance use and urine drug testing are common ways to track progress. Once goals are achieved (e.g., 1 week of abstinence or a lower level of substance use), an agreed-upon reward is earned. Some rewards considered are gift cards, access to a vehicle, or extra time with friends. Rewards may be provided in the clinic or administered by parents at home. It is recommended parents avoid providing cash rewards as this may trigger substance use; instead, gift cards to specific vendors are preferred. When correctly applied, contingency management planning offers incentives to eliminate substance use and increase motivation to maintain long-term abstinence.

Conclusions

While David has had minimal recent involvement in non-drug-using activities, he used to enjoy swimming, working out, and playing sports. Due to limited social networks promoting abstinence, his clinician recommends joining a recreational sports team at his local gym.

Another vital aspect of promoting abstinence in adolescents is parental/caregiver involvement. David shares that he has limited supervision from his parents, stating, "They are almost never home. I know their jobs are demanding and they work long hours, but it makes it easier for my friends to come over and use." His clinician meets separately with his parents to encourage limit setting, closer monitoring, and shared family activities.

David's clinician also recommends attendance at a local 12-step self-help meeting tailored to young adults. Providing David with education about the model's "higher power" can reduce avoidance as it is often equated to a belief in "god." David's clinician helps David understand that the belief in a higher power does not necessarily align with a religious belief; rather it is any "power" outside of David that can assist with recovery. David is therefore prepared for this particular element of 12-step self-help recovery when he attends his first meeting.

References

1. Godley SH, Smith JE, Meyers RJ, Godley MD. The adolescent community reinforcement approach: a clinical guide for treating substance use disorders. Normal: Chestnut Health Systems; 2016.
2. Kelly JF, Dow SJ, Yeterian JD, Kahler CW. Can 12-step group participation strengthen and extend the benefits of adolescent addiction treatment? A prospective analysis. Drug Alcohol Depend. 2010;110(1–2):117–25.
3. Stanger C, Lansing AH, Budney AJ. Advances in research on contingency management for adolescent substance use. Child Adolesc Psychiatr Clin N Am. 2016;25(4):645–59.

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